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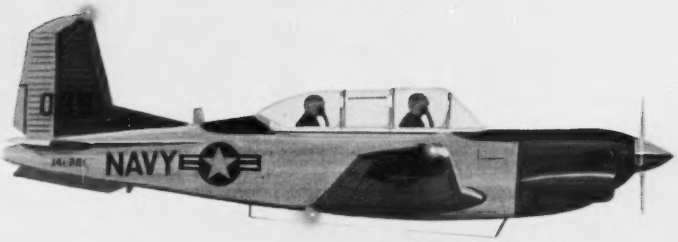
approach

SEPTEMBER 1975 THE NAVAL AVIATION SAFETY REVIEW



THE T-34C

A THING OF BEAUTY

By Robert R. (Bob) Stone
Engineering Test Pilot
Beech Aircraft Corporation

THE T-34 "Charlie" *is a thing of beauty,* and I have consistently repeated that statement since my grin-infested return from Charlie's first flight. The T-34C possesses all the nice handling qualities of the T-28 and T-34B, but with *quiet performance.*

The original request to Beech from the Navy was for "an airplane we can fly a lot and not have to fix very much." Implied in the "fly a lot" was economy of direct operating cost, and the Pratt & Whitney PT6-25 turboprop engine in Charlie burns only 30 gallons of JP per hour. The 715 SHP (shaft horsepower) capable, free turbine engine is operationally most similar to a two-stage fan jet (one go lever) and has been mechanically torque limited to 400 SHP for exceptionally long, reliable engine life. That 400 SHP is available to nearly 20,000 feet on a standard day, and there will be no worries about over/underboost, overtorque, or overtemperature even with a failed torque limiter. The Navy Test Center's unofficial comment was: "There is *no way* to hurt that funky little engine!" For further engine protection, an inverted oil system was added, allowing sustained inverted flight for more than 2 minutes which is longer than anyone needs to sit on their shoulders.

The T-34C came out looking a lot like a T-34B because that's how an airplane looks which retains the excellent low-speed handling qualities of a light plane but which, with the addition of smooth, *quiet* horsepower, can get up to altitudes and out to airspeeds where it displays the sensations of a jet. Consideration of the following comparison table should dispel some impressions of similarity between the T-34B and T-34C.

The advanced state-of-the-art solid state avionics package includes the following: UHF communication, TACAN with RMI and bearing selector with provisions for area navigation equipment addition, omni receiver for Nav. and Comm. backup, 4096 code transponders with altitude reporting in each cockpit providing redundancy, and an ELT (emergency locator transmitter). 1

A freon air-conditioner controlled in each cockpit will provide 100 percent ground cooldown even at idle engine speeds – no more air-cycle, air-conditioner

TRAINER COMPARISON TABLE

Dimensions:	T-34B	T-34C	T-28B
Span (ft)	32.8	33.3	41.0
Length (ft)	25.9	28.7	33.0
Max Gross (lbs)	2975	4300	8050
Max Airspeeds: (KCAS)			
20,000	–	280	295
10,000	240	350	333
Sea Level	240	350	342

References

T-34B NAVAER 0190KDB-501 (T-34B Flight Handbook).
Model T-34C Airplane Detail Specifications No. SD-507-3.
T-28B NAVWEPS 01-60FGB-1 (NATOPS Flight Manual).

snowstorms during takeoff. This feature will eliminate the need for canopy open operation since the air-conditioner can provide environmental control from chocks to chocks.

More of the improvements include: high-intensity strobe lights, LSO lights for landing gear position and AOA (angle-of-attack), both cockpits equipped with AOA indicator and indexer, rudder-shaker for stall warning like the T-2C, sparker autoignition, full feathering and ground reversing propeller, Beech parts logistics responsibility, cockpit annunciator warning systems, and a fire detection system.

Evolution of the T-34C. The first of two YT-34C prototypes made its first flight less than 6 months after the Navy signed a contract with Beech Aircraft for a T-34 "Turboprop Feasibility Evaluation." Prior to first flight, a predominant stable flat spin mode was discovered in the NASA Langley spin tunnel. After NASA evolved two devices, either of which promoted a stable, recoverable, moderate spin mode, *both* devices were installed on the test aircraft prior to spinning. Due to performance compatibility and common UHF communication, the other "Charlie" was used for chase.

The T-34C was found to be a neutral (near zero) IYMP (inertia yawing moment parameter) airplane for which the optimum spin control for recovery could not be predicted analytically. Therefore – flight test.

The following quote from NASA TND-6575 was an interesting comment for test pilot job security: "The spinning motion is very complicated and involves simultaneous rolling, yawing, and pitching while the airplane is at high angles-of-attack and sideslip. Since it involves separated flows in the region beyond the stall, the aerodynamic characteristics of the airplane are very nonlinear and time-dependent; and hence, at the present time, the spin is not very amenable to theoretical analyses."

An intensive 2-month flight test program included 175 spins and defined the safe flight envelope for Navy evaluation. During early tests, an "aggravated spin mode" (common to all straight wing neutral IYMP airplanes) was discovered, from which recovery was impaired by disorientingly high spin rate and difficulty of control action. This "aggravated mode" was produced by holding the rudder pro-spin and pushing the stick full forward from a stable spin. The airplane transitioned from a 160-deg/sec spin rate in a 45-degree nosedown spin attitude, to a 70-degree plus nosedown attitude with a spin rate in excess of 300 deg/sec. Furthermore, this new spin mode was very stable, and reversing the rudder (which completed the stick forward, rudder anticommon spin recovery control position) did *not* bring about recovery. The only way to recover was to go back: pro-spin rudder, stick aft for one turn, and *then* apply a normal recovery.

The first NPE (Navy Preliminary Evaluation)

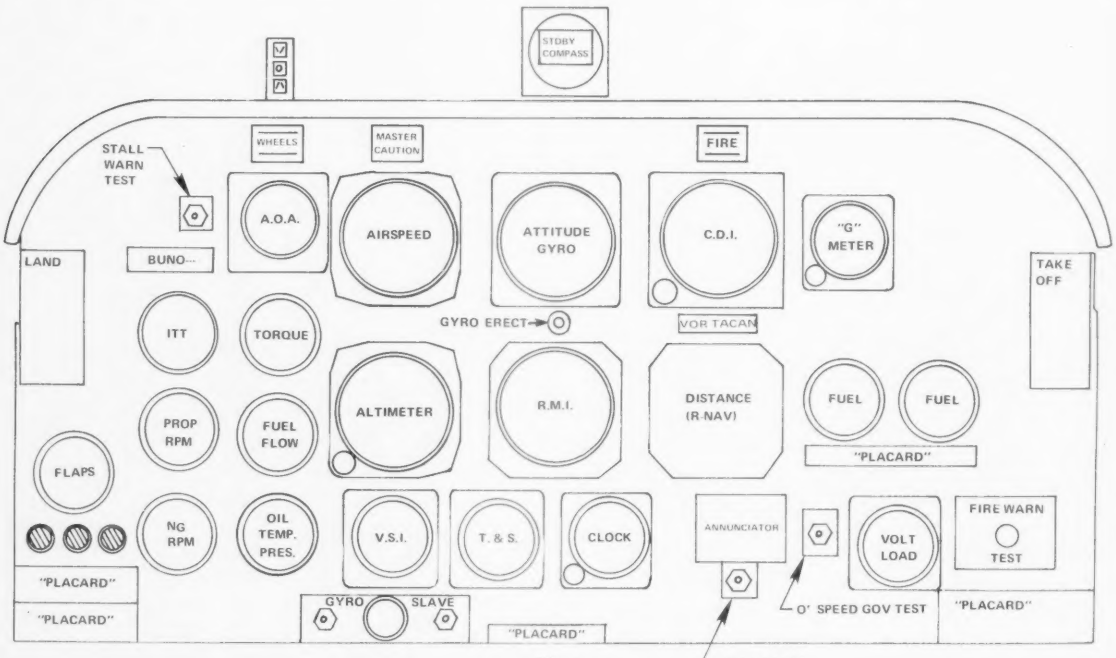


Fig. 1
T-34C INSTRUMENT PANEL

consisted of 55 flights which included only one spin flight, comprising six spins, one of which was "aggravated." Results of the NPE showed that "The YT-34C exhibited excellent potential to perform the primary training mission" and "Installation of a turboprop engine, angle-of-attack indicator, and an upgraded avionics package makes the YT-34C a superior trainer to the present trainer airplanes" which it would replace. However, the Navy declined to enter a production contract due to "spin and spin recovery characteristics" and four other part one (major) NPE deficiencies.

The ensuing 7-month development program, supported by the NASA Langley spin tunnel, consisted primarily of spin development and included 1200 spins, one antispin parachute-required recovery, some 15 aerodynamic configurations, and several difficult dynamically oscillated spin recoveries.

After achieving reliable, consistent rudder primary recoveries in all conditions, the final excellent YT-34C spin characteristics were compared with those of the T-34B, T-28, and T-37 by inflight evaluation and were found to be superior to all. The "Charlie" would still "aggravate," but from a stable rate of only 100-120 deg/sec. The "aggravation" brought the rate up to less than 180 deg/sec and recovery was effected in less than two turns with rudder only. The T-28 rudder-only recovery from its "aggravation" took 3.5 to 4 turns to recover, and the T-37 required the complicated "back pro-spin" recovery technique from much higher "aggravated" spin rates.

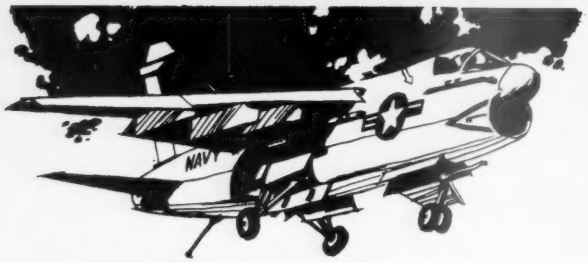
The second NPE consisted of 46 flights, over half of which included spins. NPE results indicated that, "The YT-34C continued to exhibit excellent potential to perform the primary training mission and should prove to be a vast improvement over present trainer airplanes" and that the critical part one deficiencies *had been corrected.*

The two YT-34C airplanes went to Pensacola for a planned 6-week OPEVAL (Operational Evaluation) which was to comprise 120 flight hours. The actual OPEVAL was completed in *3 weeks* and only 97.4 flight hours. This was due to 100 percent airplane availability, the excellent training time efficiency of "Charlie," and the enthusiasm of participating instructor pilots. Results of the OPEVAL concluded that the "Analysis of data indicates that the T-34C will be operationally effective. Overall airplane handling qualities, system operation, and engine performance were generally evaluated as being superior to those of the present trainer airplanes."

After successful completion of the second NPE and the OPEVAL, the T-34C became eligible for a Navy production contract. Accordingly, the "Charlie" should soon be a common sight in the skies surrounding Pensacola.

Look for it! It's a real performer. ◄

AIR BREAKS



Personnel Transfer Trubs. A crew of an SH-3 was conducting a personnel transfer to a DD. Winds were 20 knots, 20 degrees port of the ship's heading, seas smooth, and visibility good. The junior pilot, qualified in model, was in the bossman seat and the HAC was in the left seat.

The passenger had been lowered safely and the crew was waiting to haul up his cranial helmet and lifevest on the rescue hoist.

Just as the crewmen were securing the items to the line, the helo began to gain altitude. The HAC advised the pilot to ease it down. The pilot lowered a mite of collective and must have also eased back cyclic at the same time. The helicopter began to drift aft as it settled.

The HAC called for appropriate corrections just a tad late. The hoist cable was pulled from the hands of the deck attendant and the cable became entangled in the lifeline around the DD's stern. The helo crewman needed no prompting and guillotined the cable. The pilot then eased the helo away from the deck and into forward flight.

Several abnormalities came to light in the investigation and can be identified as factors in this "ripoff." The pilot became fixated on the LSE and failed to notice the gain in altitude or subsequent aft movement. Also contributing to the near mishap were unfamiliar, nonstandard hand signals used by the LSE. Finally, the proximity of the lifelines to the working area and poor communications between the crewman and pilot in the aircraft were also factors.

A personnel transfer is one of the most demanding evolutions a helo pilot ever undertakes. The pilot must enter a good, steady hover and hold it until advised by his crewman that the hoist cable is back up and secured.

Midair Fatality. An A-4 pilot was fatally injured when his aircraft collided with an F-4J operating in an offshore warning area. The crews of both aircraft were responsible for maintaining separation from other traffic.

The primary cause of the accident was a breakdown in lookout doctrine by both aircrews. The A-4 pilot had changed frequencies three times, IFF squawk once, and TACAN channels once in the 3-4 minutes preceding the accident. The F-4J crew, meanwhile, was having cabin pressure problems, had made a 180-degree climbing right turn, and was preoccupied with a master caution light. At initial sight (about 1-2 seconds prior to impact), both pilots believed the other was at a higher altitude and nosed over to avoid collision.

Keep your head out of the cockpit as much as possible and keep a good lookout. Your life depends upon it.

Straight In. After a long, overnight, transatlantic flight to a naval station, the pilot commenced a TACAN approach from FL230 at the IAF (initial approach fix). He was cleared for two 360-degree turns with gear and flaps down to lose altitude. The aircraft, a P-3B, descended well below minimums to 150 feet at 2500 fpm before the pilot recovered, on a 4-mile final.

The PPC, an experienced second-tour pilot, was in the left seat. Besides the copilot, the flight engineer and two observers were in the cockpit observing the maneuver with full confidence – in the

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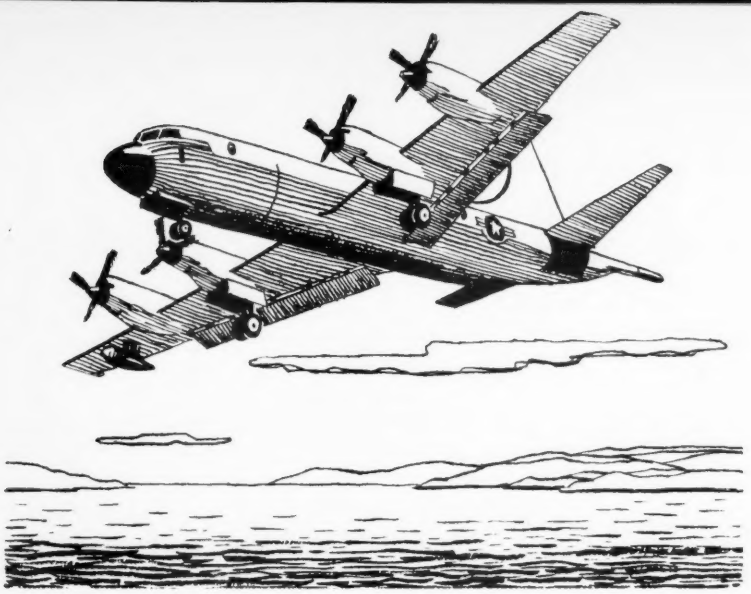


mistaken belief that the PPC was in full control of the situation.

The main factor permitting this goof was that the PPC had worked all day before embarking on the flight. This sent the fatigue factor off the scale and permitted a complacent feeling to enter. "I believe the CAVU weather and having a long, well-lighted runway in sight also contributed to the complacency," the PPC said.

The copilot properly called out altitudes in accordance with NATOPS, but they simply did not register. There wasn't any panic, anxious warnings, or any attempt to take over the controls as five of us watched the aircraft almost fly into the water. It wasn't until the radar altimeter low-alt warning light illuminated that the PPC recognized the danger and recovered. The new style barometric digital altimeter was not effective in emphasizing that they had descended below 1000 feet.

The following crewmember rest requirements are considered to be the minimum criteria which will provide an optimum level of physical and mental performance during flight operations:

1. Flights of less than 6 cumulative hours duration originating during normal working hours require no specified prelaunch crew rest period.

2. All other flights require 10 hours crew rest prior to scheduled preflight time.

3. Flight personnel should not be scheduled for continuous alert and/or flight duty (required awake) in excess of 18 hours. Maintenance and operational delays prior to takeoff should be included in this computation.

4. A minimum of 15 hours of crew rest is required between postflight and preflight of the next assigned mission (P-3 NATOPS).

I Just Can't Believe It. P-3A maintenance being performed on No. 1 engine.

No. 2 and 3 engines were turning.

No lookout, no taxi director, no one out front.

Mech was working on No. 1 engine on a workstand.

A "supervisor" was in the aircraft, not in the cockpit.

If your squadron doesn't get into the safety act – and real soon, someone's in for a bad trip.

Merrily We Roll . . . Ceiling and visibility were unlimited as we made our last landing on a night fam flight. Nearing the end of the runway, Tower asked if we would take off and investigate light signals reported approximately 15 miles southeast. We replied in the affirmative and were told to make a 180 at the end of the runway and hold.

Tower switched us to Approach for additional information, and a series of conversations ensued between us, the Tower, and Approach on different frequencies.

We completed the takeoff checklist and were requested by Approach to report airborne. We momentarily forgot about the Tower and took off sans clearance. Fortunately, there wasn't any other traffic.

How could two pilots be so negligent?

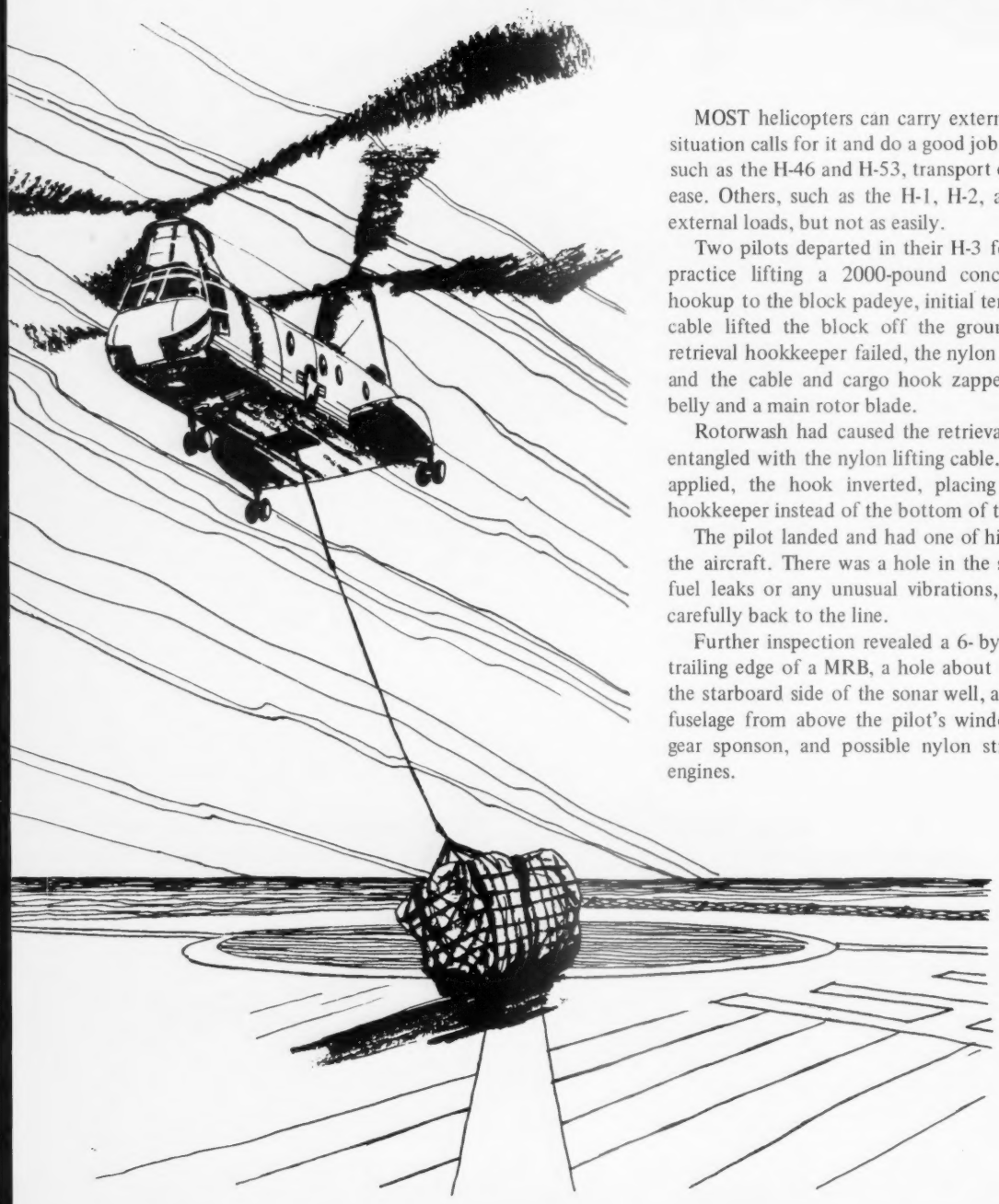
Easy. Just let the "urgency" of the situation override experience, procedures, and checklists. I see it happen all the time.

Oops, Slips. The HAC of an SH-2F was taxiing to his parking spot after a local training flight. The director signaled the helo pilot to stop and gave the chockman the OK to insert chocks. While setting the parking brake, the pilot's foot slipped off the toe brake and the helo swerved about 25 degrees left with the chocks in place. The chockman narrowly escaped injury.

The director had not waited for the pilot to signal "brakes set – insert chocks." The brake pedal didn't have a nonskid surface or guard to prevent the flight boot toe from slipping off.

The squadron recommended that directors ashore wait for the pilots' signal to install chocks and tiedowns. Aboard ship this procedure is SOP. The squadron also added a local MRC inspection card to ensure brake pedals are coated with a nonskid material. ◄

EXTERNAL



MOST helicopters can carry external loads when the situation calls for it and do a good job. Some helicopters, such as the H-46 and H-53, transport external loads with ease. Others, such as the H-1, H-2, and H-3, can carry external loads, but not as easily.

Two pilots departed in their H-3 for a lifting area to practice lifting a 2000-pound concrete block. After hookup to the block padeye, initial tension on the nylon cable lifted the block off the ground. Suddenly, the retrieval hookkeeper failed, the nylon cable whipped up, and the cable and cargo hook zapped the helicopter's belly and a main rotor blade.

Rotorwash had caused the retrieval hook to become entangled with the nylon lifting cable. When tension was applied, the hook inverted, placing the load on the hookkeeper instead of the bottom of the hook.

The pilot landed and had one of his crewmen inspect the aircraft. There was a hole in the sonar well, but no fuel leaks or any unusual vibrations, so the pilot flew carefully back to the line.

Further inspection revealed a 6- by 4-inch hole in the trailing edge of a MRB, a hole about 1½ feet square on the starboard side of the sonar well, a 6-foot dent in the fuselage from above the pilot's window to the landing gear sponson, and possible nylon strap FOD to both engines.

LOADS

A UH-1N was engaged in external lifts during LPH crossdecking operations. The pilot had lifted from the bow of one LPH to deliver a load to the nearby relieving LPH.

As the helicopter accelerated, the 1000-pound load began to sway slightly. Speed was decreased to 55 knots, and the load settled down. A few seconds later, the pilot felt the helo decelerate and pitch down. Simultaneously, the crew chief advised the pilot the lid of the container had opened and the contents were spilling out. The rest of the load began to sway violently and was jettisoned.

The pilot landed as soon as possible, and postflight inspection revealed slight damage to the helicopter's skin.

An H-2 was carrying an 800-pound load of lumber and antenna sections from ship to shore. About a mile from the beach, the load began lateral oscillations which kept increasing in amplitude. Winds were 20, gusting to 35 knots, across the track of the helo. The pilot descended and slowed to 40 knots. He was unable to streamline the load and had to jettison it. The helicopter was not damaged, and subsequently, the load was recovered by boat.

These mishaps illustrate how easy it is for a flight with an external load to turn to worms – under varying conditions. The H-3 mishap involved poor hookup technique; the H-1 mishap involved poor load security; and the H-2 incident was caused by the pilot attempting to haul an aerodynamically unbalanced load in gusty wind conditions.

Most of the problems encountered in carrying external loads center around the instability of the loads in flight. Normally, loads can be stabilized by reducing airspeed, increasing the weight of the loads, or positioning it so that the narrowest surface faces the direction of flight.

Slings and webbing should be stored in a dry area and preferably hung up to prevent contact with sharp objects. They should be inspected before and after each use to ensure integrity. If the slings and webbing are wet or dirty with grease and oil, they should be taken out of service.

Another important aspect of carrying external loads safely is communications between the crew chief and the pilot. The crew chief must have good intercom with the pilot. He should be trained to recognize proper rigging and security of the load and have the final say whether or not to hook up the load. He then must be able to watch the load in flight and advise the pilot how it is riding. Often, the crew chief will be able to detect oscillations before the pilot can feel them in the controls, and he must convey this information to the pilot before the oscillations become dangerous.

Pilots who carry external loads on the rescue hoist assembly must be careful on pickup not to exceed lateral CG limits. One final point applicable to all pilots is the necessity for smoothness on the controls. Climbs, descents, and turns should be g-e-n-t-l-e. ◄

Private Off-Duty Flying

A RECENT survey of Naval Safety Center records revealed that at least 19 enlisted and 16 officer personnel have received fatal injuries in private flying accidents during the period from 1 July 1969 to 31 August 1974. Thus, private flying, and safety precautions applying thereto, are subjects of concern to many APPROACH readers.

Navy personnel engaged in private flying, whether as Navy Flying Club members or otherwise, are invited to submit safety-oriented material to APPROACH for publication. Do it now. Let's shed some light on this important area of off-duty activity.

Who's Being Transferred?

Submitted by VP-31

EACH year we are warned about the hazards of winter flying, the potential for a soaring accident rate following the Christmas holiday season, and the various unsafe recurring trends experienced in Naval Aviation. Add one more – SUMMER TRANSFERS!

Following up on the idea found in recent back-in-the-saddle day summaries and other safety messages, this command initiated a thorough review of past mishap reports. The mishap rate was charted for the past 2 years. There was a rapid rise in the mishap rate during the summer months. At first this didn't compute, for summer is the smooth-flying period, uncomplicated by ice, snow, shorter daylight hours, cold, and IFR conditions.

A close look revealed that material caused mishaps remained fairly constant through the summer; however, personnel caused mishaps increased by 15 to 20 percent. Why? Again we dug into the statistics. We ruled out spring fever and a poor diet of beer and hot dogs at picnics, and performed a further breakdown in the personnel area.

After sifting through squadron records, two events seemed related to the May, June, July, and August rise in mishaps – personnel transfers and annual leave. A family man's best time to relocate to a new duty station is summer when the children are out of school! And it follows that with the children home and the weather warm, why not visit grandmother or take that camping trip!

The rapid loss of experienced, rated maintenance personnel puts more and more inexperienced mechanics, metalsmiths, and electricians on the job. This factor is compounded by a reduction of available collateral duty inspectors and supervisors due to leave. As the new petty officers begin to get "checked out" and better trained, and the ranks of supervisors increase as the heavy leave period ends in early September, the personnel caused mishap rate decreases, remaining at a consistently low rate for 8 months until July.

This analysis resulted from a relatively small data sampling taken from a nondeploying Training Squadron. But it could apply to your squadron and its deployment, training, standdown, and ready cycles. Run out the data; try it! When do the major transfers occur in your squadron?

We now have an area to concentrate on that could significantly aid us in breaking the link in that ever-growing chain that leads to an accident. After all, PREVENTION is the name of the game. ◄

Bravo Zulu

LT Dan Burkhart
and
LT Bernie Zacharias
Fighter Squadron TWO

ON 27 January 1975, LT Burkhart and his NFO, LT Zacharias, were engaged in a test flight from USS ENTERPRISE (CVAN-65) when the left engine of their F-14 *Tomcat* experienced a power loss during a rendezvous. LT Burkhart found it necessary to shut the engine down and restart it in order to regain normal power response.

Electing to hold overhead rather than fly their test profile, the crew informed the ship of their difficulties (there was also a landing gear door which would not close), and entered the high delta pattern. No further difficulties were encountered during holding.

Later, during the descent, LT Burkhart lowered the landing gear and brought both engines to IDLE. Shortly thereafter, he noticed both engines had lost power, stabilizing at an RPM well below IDLE. Moving the throttles, he discovered that neither engine would respond. He raised the landing gear and lowered the nose to accelerate to a speed appropriate for a windmill start. LT Zacharias broadcast their problem and location to the ship, and informed them they were passing 10,000 feet. With LT Zacharias calling out altitudes every 2000 feet on the UHF, LT Burkhart secured the engines and initiated airstart procedures. Passing 5000 feet, the left engine lit off, but hung up at 45 percent RPM. LT Burkhart secured the engines again and immediately brought the right throttle around the horn. A lightoff was achieved and the engine came up to speed passing 2000 feet. LT Burkhart leveled off at about 1800 feet.

Left, LT Dan Burkhart (Pilot)
Right, LT Bernie Zacharias (RIO)

Further attempts to relight the left engine were unsuccessful. The crew declared an emergency, and requested an immediate landing.

LT Burkhart cooly performed an OK single-engine landing. Following arrestment – as the right engine was idled from MRT – it flamed out.

LT Burkhart and LT Zacharias, through their excellent crew coordination and coolheaded professional judgment and airmanship, mastered an extremely dangerous situation and saved an aircraft to fly again. Well Done!

NAVAL MESSAGE

FROM: CHNAVMAT

I EXTEND MY GREATEST PERSONAL ADMIRATION AND GRATITUDE TO THE YOUNG GENTLEMEN WHO SUCCESSFULLY RETURNED THAT F-14 TO THE CARRIER. THE TECHNICAL COMMUNITY OF OUR NAVY IS IN THEIR EVERLASTING DEBT FOR THE ABSOLUTELY MAGNIFICENT AIRMANSHIP DEMONSTRATED WHICH HAS MADE IT POSSIBLE TO DIAGNOSE CORRECTLY FROM A PATIENT ON THE OPERATING TABLE RATHER THAN GO THROUGH THE AGONIES OF UNCONFIRMABLE GUESSWORK WHICH ALWAYS ACCOMPANY THOSE CASUALTIES WHEREIN WE ARE DENIED A CORPUS DELECTI. MY HAT IS OFF TO THESE YOUNGSTERS. WITH HIGHEST ESTEEM,
ADM KIDD

The visual approach procedure discussed in this article is a useful tool in expediting landing operations involving aircraft on IFR flight plans. Its widespread use could serve to alleviate problems similar to those discussed in the article "Some Thoughts About Positive Control" in the SEP '74 issue. Although this procedure is normally initiated by the controller, the pilot may request it. In any case, the procedure provides the advantages of a visual approach while retaining the benefits of an IFR flight plan such as organized sequencing, traffic information, expeditious handling, and guidance on the most direct route to the field.

cleared for a visual approach

By James D. Lang, FAA
USAF Directorate of Aerospace Safety

WHAT is this "visual approach" business all about when it comes to controlling IFR traffic? The practical aspect is that no matter what your circumstances may have been in the enroute environment, or *regardless* of your type flight plan, you may have to contend with a concentration of VFR traffic if the conditions in the terminal area are at or above VFR minima. By a nearly direct vector to the traffic pattern, instead of a lengthy route to a GCA gate or the ILS localizer, you have less exposure to the VFR aircraft. Assuming extensive VFR traffic, the less maneuvering you do to mix with it, the less your chance of potential problems. Another important consideration is that by decreasing time in processing an IFR arrival, the IFR acceptance rate of the airport is proportionally increased.

How does it work in practice?

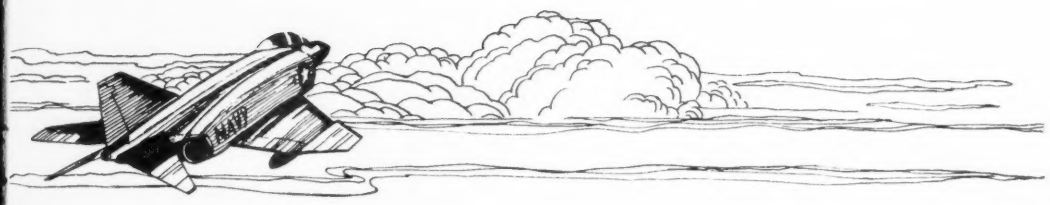
Let's say you are filed IFR into a busy terminal complex. Weather is CAVU. Center hands you off to Approach. Approach acknowledges your initial call-up and then states, "Navy 123, this will be a radar vector to the traffic pattern for a visual approach. Turn right to heading so-and-so. Maintain such-and-such, report field in sight." Minutes later you hear the same transmission to Navy 456.

What have you got now? The weather is VFR, remember? Busy terminal area, and probable heavy VFR traffic, remember? There is another IFR aircraft being set up for a visual approach to the same runway, remember?

Here's what you've got for sure. Full standard separation from all other IFR traffic (including the other aircraft running a visual approach to the same airport as you). *That's all!* It is precisely the same thing you would have were you executing a complete TACAN, ILS, or GCA approach.

What should you expect from here on?

First, you may rest assured that Navy 456 will be separated from you by IFR standards, i.e., either 3 miles laterally or 1000 feet vertically. You may expect radar traffic information on VFR traffic in your line of flight,



but you will not be vectored (nor will the VFR target) for separation purposes unless you specifically request it. Navy 456 is receiving precisely the same service as you. In your case, as well as that of 456, visual separation as an IFR principle is NOT being applied in calling the VFR traffic. Remember, one authorized radar traffic information advisory to alert you to VFR traffic is: "Numerous targets vicinity of so-and-so."

Remember especially that the hemispherical altitude rule for VFR traffic is *not* applicable below 3000 feet AGL.

Say you pick up the field at 10 to 12 miles and so inform Approach. At this point, you'll be cleared for a visual approach. This removes previously imposed altitude restrictions and allows you to descend to a specified pattern altitude. No more vectors! The only thing you'll get from Approach now is traffic information until you are instructed to contact the tower. At this time, Approach Control's job of *approach sequencing* is completed. Tower will then space you with the VFR traffic in the pattern and give clearance for landing.

Meanwhile, Navy 456 has reported you in sight and accepted a clearance to "follow" you. By doing this, Navy 456 has accepted a responsibility in relation to you. He must maneuver his aircraft to avoid you.

So what does all this mean? It means that by utilizing visual approaches and visual separation, the system can move more IFR traffic per unit of time without compromising the IFR status of those aircraft on IFR flight plans. It means that the IFR/VFR mix in terminal areas is still a factor to be reckoned with. It points out most dramatically that the mere existence of an IFR flight plan does not provide an envelope of exclusive airspace for the IFR flight in VFR conditions. Above all, it means that when operating in VFR conditions, regardless of type of flight plan, someone in the cockpit or on the flight deck had best be all eyeballs until you feel the gear dragging concrete at your destination.

Courtesy *Aerospace Safety*

From FAA Handbook 7110.8C, Chapter 1, Section 3, Para 23 – Definitions:

"Visual Approach: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of a radar facility having an air traffic control authorization, may deviate from the prescribed instrument approach procedure and proceed to the airport of destination, served by an operational control tower, by visual reference to the surface.

"Visual Separation: A means of separating IFR, FW/SIFR, SVFR, and, where special programs are in effect, VFR aircraft in terminal areas wherein either of the following methods is applied:

"a. The tower controller sees the aircraft involved and issues information and instructions, as necessary, to ensure that the aircraft avoid each other.

"b. A pilot sees the other aircraft involved, and upon instructions from the controller, provides his own separation by maneuvering his aircraft as necessary to avoid it . . . A pilot's acceptance of traffic information and instructions to follow another aircraft or provide visual separation from it are considered to constitute acknowledgement that he sees the other aircraft and will avoid it . . ."

Happy Hour at Breezy Point was in full swing and the old adage, "there's always room for one more," didn't apply. The place was chockablock. Two pilots standing at the bar glanced at each other and instant recognition took place.

"Hey, Jack, haven't seen you since we got back from the Med. How are things?"

"Great. What do you hear from the guys?"

"Well, lessee. You remember Pete Plunger?"

"Sure. Last I heard he was still driving *Stoofs*. He used to brag he could make 'em talk."

"Well, not anymore. You remember how he used to push his luck? I guess he found one he couldn't handle. He was driving that S-2 that spun in a few weeks ago, out west."

"Oh, damn! That's too bad."

"Yeah. Board said pilot error all the way."

"No kidding? Hey! We're empty. Buy you one?"

When was the last time you engaged in a similar conversation after a buddy was lost? Quite often, the departed soul, before departing, made no bones about letting the world know that he was flying . . .

A Very Forgiving Aircraft

By LCDR Jay B. Russell
VAW-125

THE conversation in the prologue isn't too farfetched. It has happened time and again. We all know pilots who treat their bird almost with disdain, and one who assumes any aircraft is forgiving is playing a game of Russian roulette.

This artificial dependence exists to some extent in every community, but more so in prop communities than in the jet league. Perhaps the swift movers, used to operating close to the max flight envelope, are more cautious. Even so, in the statistics of every type mishap there is evidence that many pilots had the attitude that something or someone would always pull the chestnuts out of the fire. That something was usually the aircraft.

Figure 1 depicts the results of a recent West German pilot study and illustrates the difference between prop and jet pilots involved in mishaps. Statistically, pilot factor accidents account for approximately 60 percent of the total, both in the U.S. Navy as well as West Germany.[1]

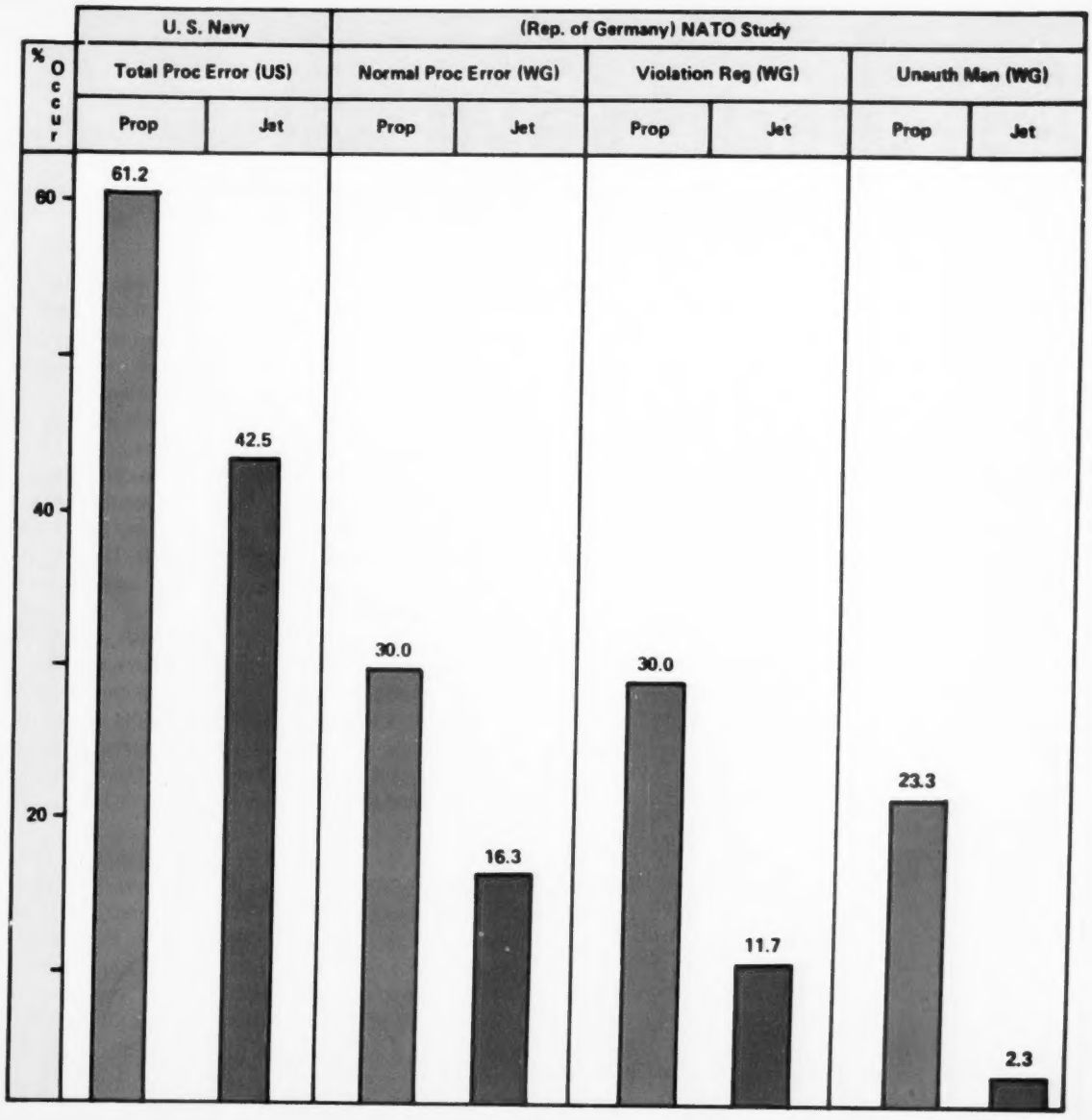
The statistics, when broken down into two or three categories, also revealed that:

- Prop pilots failed to recall and execute normal procedures about one-third of the time, a rate twice as high as jet pilots.
- Prop pilots failed to observe regulations about 30 percent of the time, compared to 10 percent by jet pilots.
- Prop pilots were involved in unauthorized maneuvers almost one-fourth of the time – a rate 10 times higher than jet pilots.

Although a Navy study[2] is slightly different, such errors are by no means nationalized. For example, total prop pilot procedural errors were cited in a whopping 61 percent of the mishaps studied – twice that of jet pilot boo-boos. Now, just who or what was the pilot depending on in these accidents? Surely not himself. In all probability, it was his aircraft.

[1] "Pilot Factor in Aircraft Accidents of the German Federal Armed Forces," B. Falckenberg, Dipl.-Psych., German Air Force Institute of Aviation Medicine. Delivered to NATO advisory group for Aerospace Research and Development, AGARD conference of 7 September 1973.

[2] "Human Factors Approach to Aircraft Accident Analysis," LT R. H. Shannon, MSC, USN, and W. L. Waag, Ph.D., Naval Aerospace Medical Research Laboratory, Naval Aerospace Medical Institute, Naval Regional Medical Center, Pensacola, FL. Delivered to NATO advisory group for Aerospace Research and Development, AGARD conference of 7 September 1973.


U. S. Navy
(Rep. of Germany) NATO Study
% Occur
Total Proc Error (US)
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Prop
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Prop
Jet
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40
20
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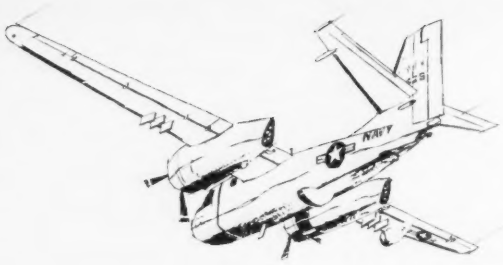
11.7
23.3
2.3

Fig. 1



This tendency toward overconfidence in the aircraft should be considered by all who are in a position to control the attitudes and actions of pilots. The reliance on the forgiving aircraft is simply another manifestation of the most insidious danger preying on pilots – *complacency*. Your bird may stall less violently than others, but it *will* stall, and it *will* spin. It may well have excess power, but it won't permit you to salvage a habitual low-slow approach when one engine is sick. Bad habits, based on a belief that your aircraft is forgiving, mean loss of aircraft and lives.

We don't have to search far for examples of the kinds of errors in Fig. 1. How 'bout wheels-up landings? Normal procedures call for the rollers down for landings, but too often this simple check proves to be a pilot's nemesis. How 'bout fuel management? Power settings, atmospheric conditions, duration of flight, the number of engines in use, are all set forth plainly in NATOPS for every bird. Yet, pilots continue to find out, the hard way, those motors won't run on fumes. How 'bout unauthorized airshows, flathatting, and impromptu oil burner routes? There are those who defy regulations and common sense and end up splattering aircraft metal and human remains all over the surface of the earth.

There is a solution to these problems, despite some who erroneously compare them to a common cold. We can treat the symptoms and take positive, preventive measures toward a cure by a healthy regimen of education and training, and instilling self discipline and a real sense of safety awareness in all pilots.

Each squadron CO provides the leadership and the safety attitude for his outfit. With the help of his senior officers, he sees that pilot education and training is continuous, interesting, and challenging. It is effective only if all pilots receive the same dose. Self discipline and safety awareness are as evident in a CO, who sets the pace, as the squadron insignia on his flight jacket – and it's contagious.

The CO, through his ASO, NATOPS, and training officer will ensure, through formal lectures and informal discussions, that all of the pilots know:

- The aerodynamic limits of the aircraft.
- The fuel, hydraulic, and electrical systems.
- Power requirements for light, normal, and heavy gross weights – all fans turning or engine out.
- Tactical uses including weapons.
- Communication, navigation, and identification procedures.

Proper training will eliminate those who might cop the plea, "I didn't know that." It will also help to prevent irregular actions, not because the pilot isn't tempted, but because he's disciplined. Pilots with healthy attitudes reflect thorough knowledge of their aircraft, make training productive, and demonstrate professional performance from go to whoa.

Squadron senior officers have to continuously evaluate all pilots to ensure that no one has the idea that the bird will let him err. The weak sister can be detected by his flying, his attitude, and his words. The one who thinks he has it by the tail is the one who needs to be jacked up abruptly.

The analysis of prop accidents reveals a very real weakness in the prop community. Since prop pilots commit certain errors two to ten times more often than jet pilots, it is easy to say jet pilots are more professional in their flying. Reevaluation is necessary, and the sooner the better. The first step is to abolish any idea a pilot may have that his bird is a very forgiving aircraft. ◄

"Hi, I'm the first accident victim."
"Hi, I'm the first safety officer."

Are you a CRT or other type of pilot with flights few and far between? Perhaps you can gain by reading this short article which the ASO, NAS Willow Grove, addressed to station pilots.

THE LINE FORMS TO THE RIGHT

By CDR R. L. Meier, ASO
NAS Willow Grove

THE requirement (and desire) to fly, coupled with an obvious lack of anything to fly in, presents a rather unsolvable and contradictory problem for most of us. If and when a cockpit does become available, there is apt to be a lineup to fly, with a tendency to "fly now and think later." Even though most of us have three, four, or even five thousand hours of flying experience, we forget many things that should be second nature to us. "No matter," we say, "we're only flying as copilot. The *other* pilot will know what to do." Don't bet on it! I'm a single-engine jock, but it seems to me that those four-engine monsters or two-engine minimonsters were designed to be flown by two pilots – *both qualified!*

While flying ability will probably remain a part of us all of our lives, knowledge of NATOPS procedures will not. When is the last time you actually studied your NATOPS manual, reviewed the Base Operations Manual, or opened up OPNAVINST 3710.7? Can't remember, right?

The last paragraph on the last page of the 18-24 August 1974 issue of the WEEKLY SUMMARY featured a quotation from a commanding officer's endorsement to an incident report that, in all probability, happened to someone in the same boat that you're in now. In case you happened to miss that particular item, I am reprinting it for your leisurely reading at this time:

> "I can't help but speculate that in this present environment of reduced flight time for CRT pilots, similar mishaps are going to continue to occur with increasing frequency. One flight a month, which is all the average CRT pilot now gets, is so insignificant in relation to maintaining flight proficiency that it becomes a farce to think that any aviator, however excellent he may be, can remain proficient and safe. We can continue to operate CRT aircraft and fly CRT pilots 4 hours a month in a relatively safe manner for a while longer. But, we are deluding ourselves if we think we can continue to exist on past momentum. When that momentum wears out, and I see ominous signs of that happening already, our accident rate will assume a spiraling slope upward. Safety premised upon one 4-hour flight a month is an inconsistent and incompatible supposition."

There are no CRT pilots flying from this air station, although for most of us, 4 hours of real flight time a month would be a luxury. With our bird forlornly sitting in the hangar for long periods of time, I realize the incentive to stay current and keep abreast of the flying business is not the greatest. With parts practically nonexistent, I visualize a lengthy continuation of this problem, even though periodically the "great grey bird" will rise to the skies above our station. It is for these brief periods that we must be prepared, if we are to maintain that polished professional pilot attitude that (hopefully) we have striven for all these years.

In an attempt to replenish some of that forgotten knowledge that we once held, I am currently looking into the feasibility of establishing a one-day (or less) ground school which would be held periodically, depending on the amount of time the "big bird" stays down between flights. Tentatively, this would include NATOPS, aircraft systems, instruments, local air traffic procedures, and other related flying subjects.

Now, before you all start shouting and tell me how busy you are, how about reflecting for a few minutes on what we're actually talking about. For example, a one-day per quarter ground training session (or flying bull session, if you prefer) means you'll have to spend a little over 5 minutes each working day to make up that lost time. I realize that it really doesn't work that way, but look at the real benefit to be gained – *your future* – if something serious happens and you don't react properly the first time. And don't kid yourself into thinking that it will never happen to you, or that the S-2 is a piece of cake. Take a look at the message board. Disregarding pilot errors, there are still plenty of maintenance and material malfunctions to keep us all on our toes. It's the sharp, knowledgeable pilot that keeps his cool and brings the airplane back.

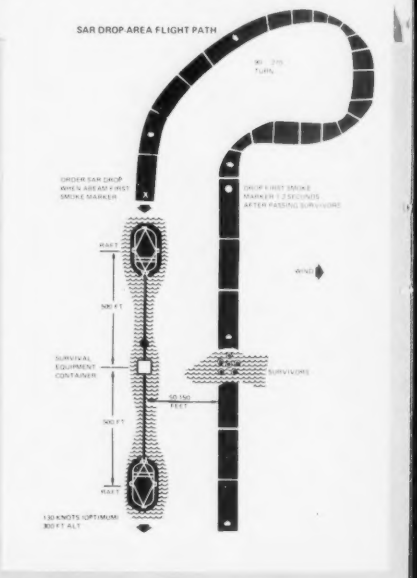
Show a little pride in those "golden wings" you wear. Spend a few minutes each day studying NATOPS. When that big "fly-day" comes again, you'll be ready for it. ◄

By LCDR A. K. Jenkins
VP-16

Your Mission:

IT is not uncommon for P-3 units to assist in search and rescue operations, especially since the *Orion* aircraft lends itself to this task with fast enroute speeds and good on-station endurance. The P-3 is well equipped for SAR operations, and if properly manned by a trained crew with an effective search plan, can quickly locate a crash site at sea. Once the site is located, the crew will drop a SAR Kit to the survivors which consists of two Mk-7 liferafts and an emergency equipment bundle. After the kit is in the water, the responsibility is with the survivors to get aboard the rafts and make use of their rescue equipment.

The SAR Kit has been developed for use by P-3 units, and as the P-3 NATOPS states, "All P-3 aircrew personnel concerned with the utilization of the SAR Kit should be familiar with its deployment preparation and deployment techniques." Unfortunately (especially for the survivors), being familiar may not be quite good enough to ensure that the kit is safely and accurately deployed on a SAR mission. The SAR Kit launching is the most critical part of the mission, and the danger comes when the crew *must* open



SAR (Search and Rescue)

the aircraft cabin door, position the SAR equipment, and then, after ensuring that no crewman is entangled with any of the many lines attaching the SAR bundles, push the equipment out of the aircraft.

Of course, the accuracy of the drop is determined by the launching being exactly "on cue." If it's not, the kit will probably land out of the survivor's reach. Since lives depend upon the accuracy of the drop, and since the actual dropping of a SAR Kit is a new experience for most crews, Patrol Squadron SIXTEEN fabricated a dummy kit to be used for training crews in SAR Kit preparation and deployment.

On the ground, crews prepare, load, and deploy the dummy kit exactly as the real SAR Kit would be – including the critical "on cue" launching of the kit from the aircraft. This training evolution gives crews real life experience in performing all the launching steps. By practicing these training drops on a regular basis, we feel we have maximized the probability that any Patrol Squadron SIXTEEN crew can safely and accurately drop a SAR Kit to sea survivors.

MISSION ACCOMPLISHED!

The LSO Head-Up Display

By LCDR C. S. Mitchell
COMNAVAIRPAC Force LSO

IN 1968, a series of studies were commenced to identify areas aboard our carriers where the workload could be reduced and individual tasks enhanced with respect to safety, accuracy, and efficiency. To date, the LSO platform, PRI-FLY, and CATCC have all been examined in detail. The review of the LSO's functions identified a need for new, improved display equipment to assist in more rapid approach performance evaluation. The basic concept was that of head-up information for the LSO, utilizing SPN-42 radar data which could be monitored simultaneously with the actual approach.

After extensive surveys to identify what approach information the LSO actually required, construction of a prototype HUD device was commenced under the auspices of NAEC Philadelphia. The final design and construction was completed under special contract to the National Bureau of Standards where unique optical materials and electronic engineering techniques were tried out. The entirely hand-constructed device was placed aboard USS RANGER for her 1974 workup and WestPac deployment. During this 10-month period, an evaluation of the HUD's basic functionalism and its interface with existing ship's equipment was conducted. This trial run surpassed all expectations, particularly with respect to the survivability of a delicate electronic device in the flight deck environment.

Following the RANGER evaluation, the entire program was reviewed and plans were formulated for a second prototype HUD. This preproduction model, incorporating some added features and minor internal circuit redesign, is expected to be installed aboard an AIRLANT carrier some time during the summer or early fall of 1975. The purpose of this step is to confirm the final installation design for installation on all SPN-42-equipped carriers.

The HUD unit actually consists of two separate displays. The upper display contains the critical approach information projected by a CRT (cathode ray tube) through a special lens and mirror system onto a combiner glass. This system is very similar to the HUD in the F-14 and A-7E, with the exception of an additional mirror. The mirror retains more of the image on the combiner thus compensating for dirt, grime, moisture, and allowing for a cheaper grade of glass to be used in case of breakage. Figure 1 is a typical upper display presentation. The scale on the left shows ramp motion with the pointer located 10 feet below the artificial horizon created by the azimuth scale when the deck is level. This creates a real-world image of the ramp moving up and down below the glidepath of the aircraft. The right-hand scale is for aircraft vertical speed. The SPN-42 provides this instantaneous rate of descent reading. The pointer is on the horizon bar when the aircraft rate of descent is 500 FPM. The arc around the display is a portion of a range ring which comes on full circle at one mile and disappears as the aircraft approaches touchdown. Here it indicates 3/8 of a mile. The aircraft pointer and glide slope scales are shown in the final

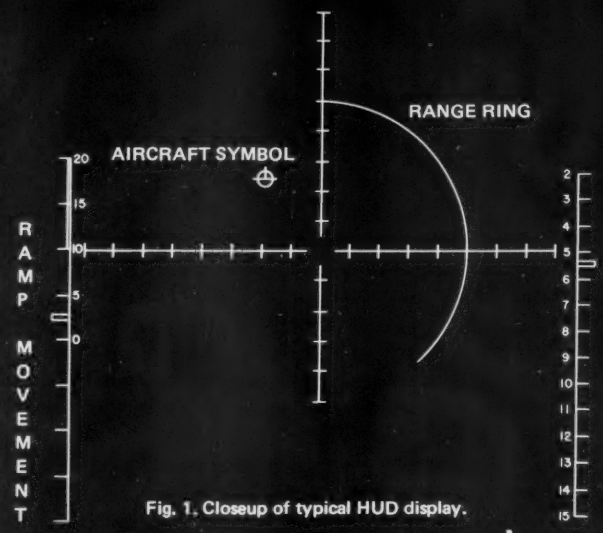


Fig. 1. Closeup of typical HUD display.

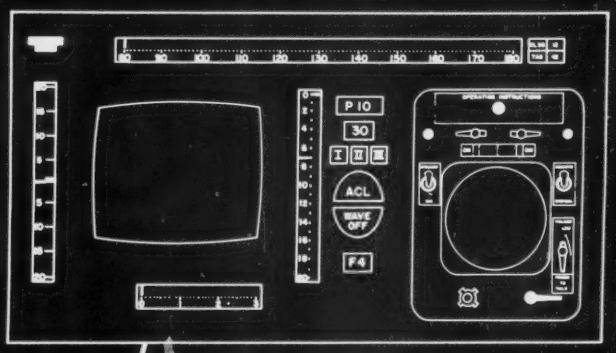


Fig. 2. Closeup of electronics cabinet.

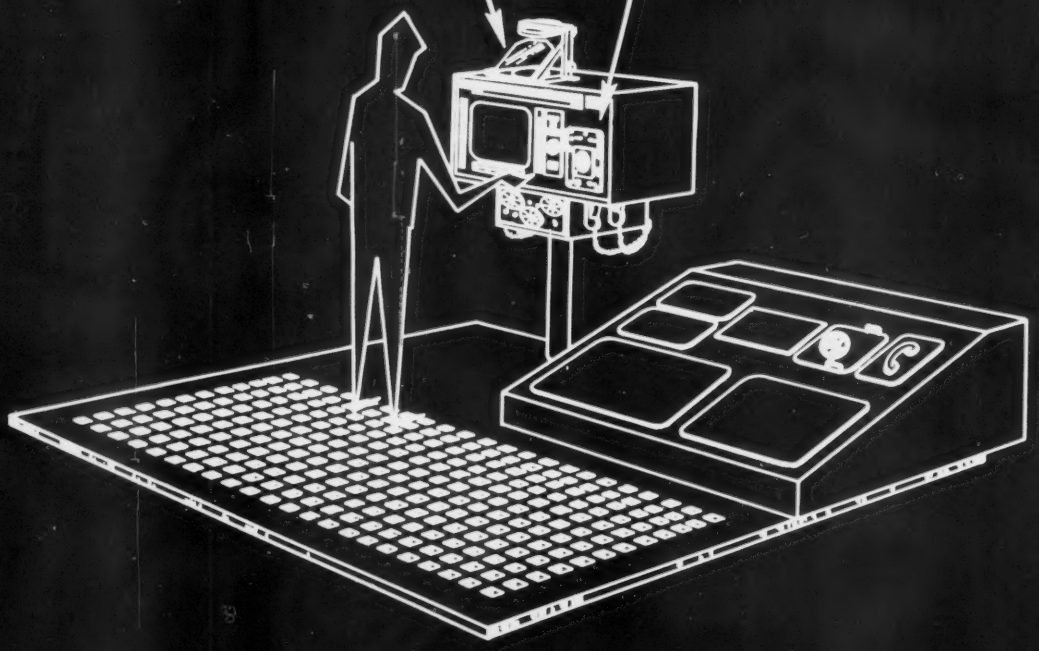


Fig. 3. Artist's concept of new LSO platform arrangement.

approach mode. The scale indices are in 10-foot increments and the aircraft symbol has wings and a tail. Outside of one mile from touchdown the scale is in 30-foot increments and the aircraft appears as a simple circle. Scale changeover is either automatic or selectable to a constant 10 or 30 feet. In the automatic mode, the scale change is readily recognized by the shift in the aircraft symbol and the appearance of the range ring.

With the exception of the ramp motion display, the information presented on the upper display is totally dependent upon SPN-42 lock-on and will be normally available only during Case III recoveries. During the RANGER evaluation, the actual utility of the upper display was found to be indispensable after a period of use. Trends can be detected and lineup much more easily monitored on the HUD display than on a PLAT image. The VSI information proved very timely in preventing a settle on the start or in the middle. More than one RANGER pilot was surprised to hear Paddles acknowledge the ball call with "Check your rate of descent," and find that he was at 1500 FPM. During approaches in actual IFR conditions, it becomes very simple for the LSO to monitor approach criteria down to minimums, and predict within feet where the aircraft will break out. It was the general consensus of the RANGER LSOs that they could monitor a MODE I approach, with confidence, up to 1/8 mile without ever seeing the aircraft.

The lower display is incorporated into the electronics cabinet that supports the PLAT, HUD CRT, and communications module. Referring to Fig. 2, the PLAT monitor is located in the left half of the cabinet with an airspeed scale, VSI, coarse Range, and Ramp Motion/Ship's TRIM Scale arranged in clockwise order around it. In the right half of the cabinet is a 19 MC station, while the module in the center contains readouts for wind direction and speed, ACL mode status, ACL system waveoff, and type aircraft on the approach. The three lights to the left of the airspeed scale are the deck status and waveoff repeater lights. Controls for light intensities, PLAT tuning, and various mode and function selector switches are located on both sides of the cabinet. Not shown is the orifice in the bottom where the banana comes out. While most of the information in the head-up display has always been available to the LSO, it was in a much cruder format and located at or below his knees. The HUD represents a quantum jump in making this data readily available to the LSO.

One popular misconception is that the HUD image is designed to be superimposed over the optimum approach path of the aircraft. In reality, it is placed adjacent to the groove and the LSO then scans from the real-world to the electronic image and back. To facilitate adjustment of optimum HUD position for various sized LSOs, the entire assembly is mounted by means of a TV camera panhead to a periscope style column which can move the HUD from its protective box under the platform up to about 7 feet of elevation.

Since there is little doubt that an LSO's eye is far more accurate than the SPN-42, it is obvious that the primary use of the HUD would be to monitor approaches in minimum weather conditions when the aircraft cannot actually be observed. However, it also serves effectively in visual conditions as a training device for inexperienced LSOs and as a good visual cross-check on the position of the ACLS electronic glide slope. The addition of sink rate information and improved lineup display make use of the HUD valuable in any atmospheric condition. In the final design installation, it is planned to use the HUD for Case I, II, and III recoveries. A basic revamping of the LSO work station will eliminate from the lower equipment consoles all items now incorporated in the HUD. These include the primary communications controls, PLAT monitor, wind indicator, and the indispensable sound power handset on which the air boss can privately critique the recovery in progress. Figure 3 is an artist's concept of this new platform arrangement. ◄

notes from your flight surgeon

Bad Show

AFTER ejection and parachute descent to the water, the two-man crew of an F-4 were in their rafts in sight of each other.

The pilot was not carrying a signal flare. His hands were so numb that by the time he got his pencil flare gun out, the helo was approaching. His strobe light was inoperative, and it later took a screwdriver to open the snaps on his survival vest where the light was stored. He was also carrying a pocket knife, screw, and (yes) a screwdriver in his flight suit leg pocket.

In addition, the pilot had tied a chamois, for cleaning his visor and wiping perspiration, in the helo lift ring of his torso harness. The rescue swimmer said afterwards that the chamois was colored with dye marker and was slippery and swollen. This made the lift ring very hard to use.

In spite of the excellent condition of the other survivor's gear, says the investigating flight surgeon, he didn't use any of his signalling devices.

Both the SAR pilots and the observing S-2 pilot commented on the absence of signals. Keeping the survivors in sight was difficult. *(A night scene would have been curtains. – Ed.)*

The flight surgeon recommends:

- Make frequent spot inspections of aviators' flight gear. Quickly remedy deficiencies. Discourage improper attempts to personalize flight gear.
- Constantly remind aviators of the importance of their equipment and how to use it. They should think of it not only in reference to themselves, but also in relation to the SAR people.

Watch It on the Flight Deck!

MAKE sure all the men in your squadron are heads up on the flight deck.

A member of a LOX crew stationed on the flight deck behind the island was told by his supervisor to go to the hangar deck for a LOX cart. He had arrived on the flight deck only minutes earlier and wasn't aware of the launch in progress.

The most direct route to the No. 1 elevator would take him behind several A-6s parked on the No. 2 elevator. Thinking that none of the aircraft were turning up, he started behind them. Halfway across the elevator, jet blast hit his back. As he turned to see where it was coming from, he was caught by the full force of an A-6's jet blast. Over the side he went.

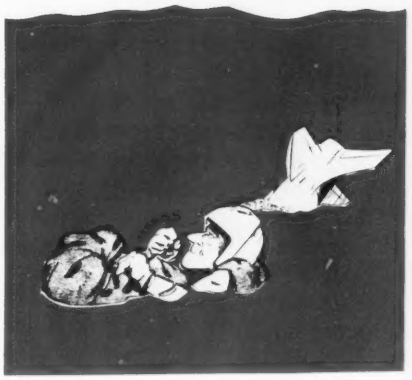
He landed in the water on his back. He inflated his lifevest and 6 minutes later was picked up by the plane guard helo.

Ship's accident investigators said the LOX crewman should have found out what evolution was taking place on the flight deck, and then walked in front of the aircraft on the elevator. He gets a good mark, though, for having his lifevest on.

Post Rescue Comment

IT wasn't as hard to get into the raft as it was in water survival. That training was worth its weight in gold.

Pilot after ejection



FLIGHT LEADER QUALIFICATION

By LT Frederick D. Hansen
ASO, VA-155

OLD procedures sometimes die hard. Nevertheless, Attack Squadron ONE FIFTY-FIVE took a hard look at its section and division leader qualification procedures and decided a change was needed. The "magic wand" that transformed nuggets into qualified section leaders at the end of their third or fourth combat line period is still being waved in the peacetime Navy. The use of this wand was an expediency created during combat which gained favor amongst the carrier squadrons involved in the war. It has never been the best way to designate flight leaders, and now with reduced flight time and traps, it has become totally unacceptable.

The responsibility of a section leader to safely accomplish a wide variety of missions demands experience, sound judgment, and a thorough knowledge of procedures, tactics, and his aircraft. The variety and tempo of operations on a standard combat cruise provided the nugget with most of these requirements through experience and repetition.

With two hops, one spare, and a pri-fly observer every day, there was little in the way of ship launch and recovery procedures, tactics, aircraft emergency procedures, or Air Wing SOP that was not covered repeatedly in briefs and executed in the air.

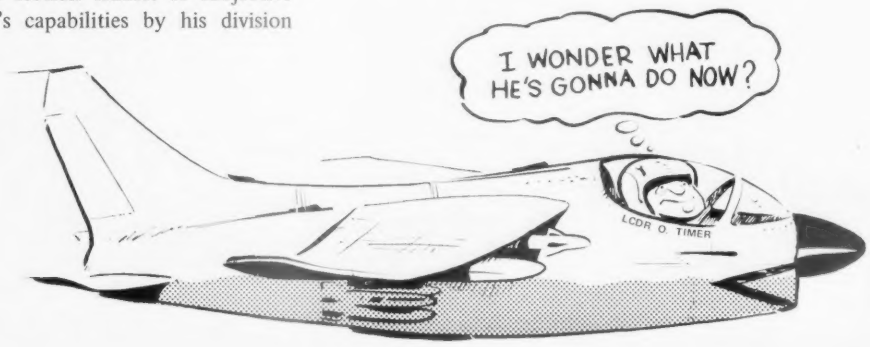
There was also a tremendous amount of incentive to read and learn as much as possible when an enemy was shooting at you, and your knowledge had the potential of increasing your life expectancy.

After one or two full line periods, most nuggets had the experience and the confidence to assume the lead for a section of aircraft in a combat environment. By the end of the fourth line period, it was indeed the unusual nugget who was not in all respects capable of assuming the responsibilities of a section leader. A subjective appraisal of the nugget's capabilities by his division leader was, under these conditions, sufficient justification to wave the "magic wand."

Contrast this with the current tempo of operations. The reduction of flight time and traps has seriously reduced the experience level of nuggets. By eliminating a highly visible enemy, the incentive to dig into the books and learn as much as possible has largely been replaced by a false sense of security otherwise known as "It can't happen to me." When experience is lacking, knowledge becomes more important, not less. The experience and confidence of pilots to correctly handle the unexpected is of more concern in an environment where each at-sea period is a minor REFTRA for the ship and Air Wing.

Based on the experience of others, procedures have been developed over the years which cover almost every conceivable situation that a carrier pilot might encounter. Squadron SOP, CAG tactical notes, NATOPS, tactical manuals, CVA/CVS NATOPS manual, just to name a few, contain the information that all pilots should know and that flight leaders *must* know. The trick is to get a pilot to read these source documents to gain the knowledge that cruise experience no longer provides.

The overall problem is twofold: (1) find a way to encourage each pilot to read for himself the various publications that cover the environment and missions he may encounter, and (2) replace the magic wand qualification of flight leaders with a more objective form of appraisal. A section leader qualification board has been established in VA-155 to solve both of these problems. The objective of this board is to analyze the knowledge, capabilities, and headwork of each pilot in the entire range of missions expected of that pilot. The membership of the board is flexible, but consists primarily of squadron division leaders. Whenever possible, a first tour qualified section leader is included on the board to put the nugget more at ease. In order to keep the division leaders up to speed, they are also required to go through the rigors of the qualification board *before* becoming a member of the board.



A key to obtaining the most from the board is to put the nugget at ease and eliminate the feeling of a "hammer session." If the nugget feels that missing the answer to any question is a black mark against him or that failure to answer any question is an automatic no-qual which will reflect on his next fitness report, then the whole concept and reason for the board has been endangered. If each member of the board has been through the same line of questioning himself, the natural apprehension which a nugget will have can more easily be appreciated and subdued.

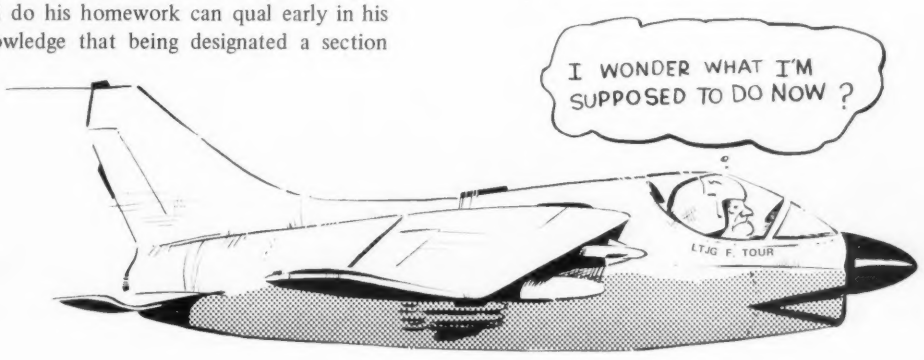
When is a nugget ready to appear before the board? To answer this, it must be realized that no two pilots progress at the same speed even in identical training environments. Knowledge and experience are being evaluated by the board; therefore, they are the key elements involved in the decision. In order to consolidate the decision on the experience level of a candidate, the operations officer was chosen to make all recommendations as to when the pilot was ready. To ensure a minimum level of knowledge, a booklet containing questions similar to those to be asked by the board was written and made available to all pilots through the operations officer. By the time a pilot has completed all the questions in the booklet, he has had to dig into the books and at times even read between the lines. This does not guarantee retention of knowledge, but will, at the very minimum, guarantee exposure to the knowledge that he should know but might otherwise miss. The more information he has become acquainted with, the less the chance that he will someday find himself with a wingman and a prayer for help.

By requiring every nugget to become section leader qualified during his tour with the squadron, a very effective incentive is created. A pilot who is willing to work hard and do his homework can qual early in his tour. The knowledge that being designated a section leader is not automatic after one cruise or any set period of time in the squadron will motivate any pilot to start working. Being a wingman may be easy, but it will never be fun, especially if his section leader has been in the squadron for a shorter period of time.

To become a designated division leader, the qualified section leader must again appear before the qualification board. The board this time is composed of qualified division leaders only and covers all areas involving multisection flights of aircraft (four planes to the Alpha gaggle). Even the second tour pilot with a combat division lead qual in his logbook is not exempt from this program.

Every time a pilot appears before the qualification board, the squadron benefits. If the board members decide that the pilot has demonstrated adequate knowledge of his aircraft, emergency procedures, tactics, and could reasonably handle himself in the many missions of the squadron, they will forward this information to the commanding officer. The CO gains a great deal of information concerning each of his pilots that he may not have otherwise observed. His personal designation of section leader qualification enhances the original incentive of being a flight leader. The operations officer, as a member of the board, has more insight into the effectiveness of his training program and any areas which may need more emphasis. If any pilot fails to pass the board, the operations officer will know what the weak areas are and can increase the training in those areas through ground training or flight training.

For the "Silver Foxes," the days of the "magic wand" are over. Knowledge is a vital element of professionalism, and professionalism is a vital element of safety.

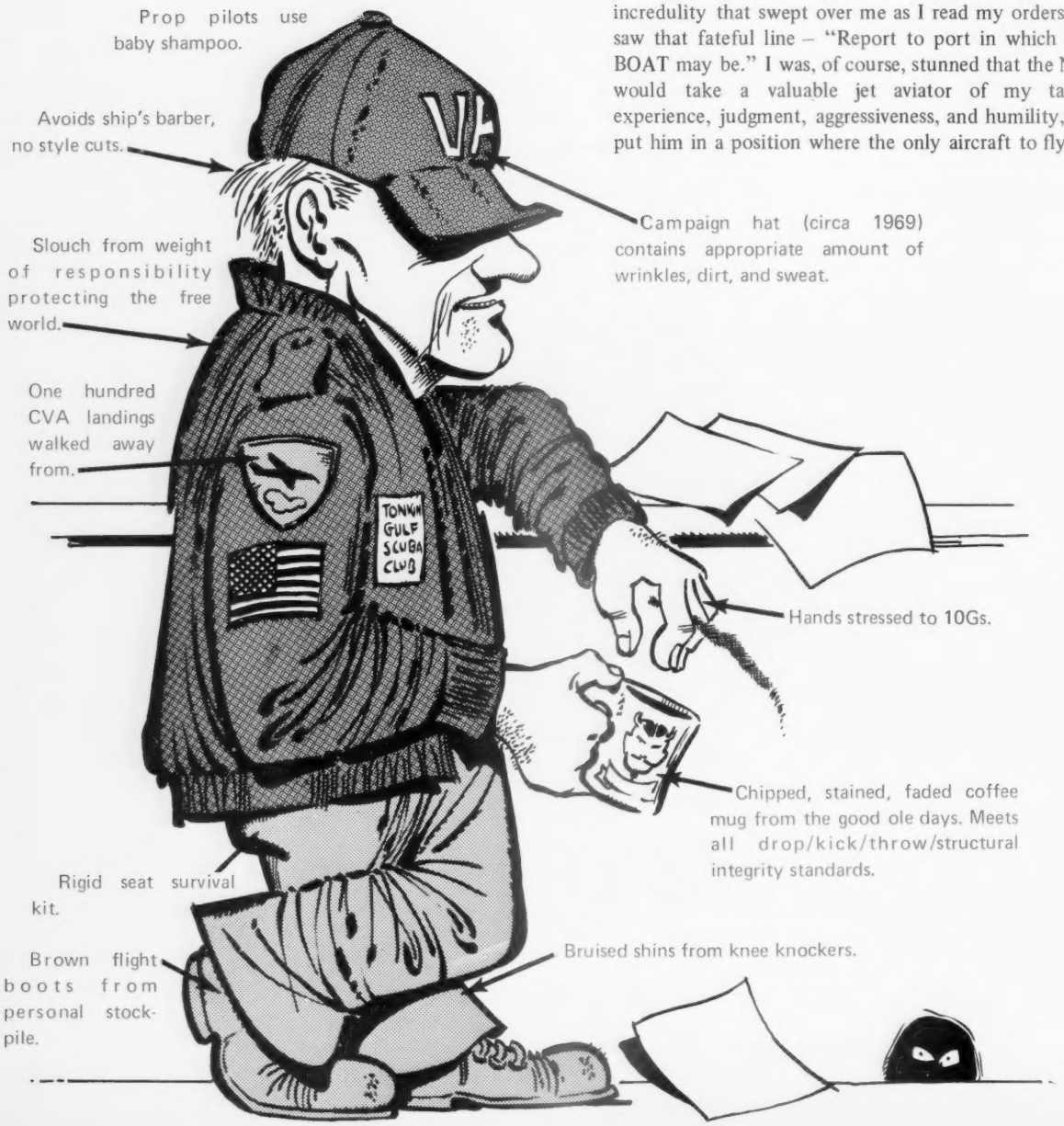


SO THIS IS PROFICIENCY(?) FLYING

(or) Romeo P. Sierra, Jet Jock, Flies the Ship's COD

Anonymous

ASK any naval aviator what three things he dreads most in life and he'll probably mention something like ramp strike, liberty in Naples, and orders to ship's company – and not necessarily in that order. Being a typical "nasal radiator," my opinions closely correspond with the above list, so you can imagine the horror and incredulity that swept over me as I read my orders and saw that fateful line – "Report to port in which USS BOAT may be." I was, of course, stunned that the Navy would take a valuable jet aviator of my talent, experience, judgment, aggressiveness, and humility, and put him in a position where the only aircraft to fly was



the C-1A. But being a dedicated naval officer, trained to accept orders as given, patriotic and loyal, I set out, with black shoes in hand, to report for duty. (Besides, my letter of resignation was not accepted since I was already in receipt of orders.)

In addition to all the obvious good deals of ship's company duty such as OOD in Port, four section duty, weekly zone inspection, etc., the excitement and challenge of a new concept – proficiency flying – made itself known to me. Since a grand total of 30 of my 2200 flight hours were in recip aircraft, I rather anticipated an indepth ground school and flight training syllabus before being thrust into the foreign surroundings of the Charlie One Alfa. Thus, I was somewhat surprised upon checking in to learn that the only training syllabus consisted of getting into the bird with another "qualified" pilot and learning the ropes from there. I vaguely remember oldtimer sea stories about this being "the way we used to do it" back in the "big one." Anyway, since this apparently sufficed for everyone else, I certainly wasn't going to make any waves. Thus, when phoned late one night and asked if I wanted to fill in on a last-minute flight vacancy the following morning, I quickly agreed.

Since the ship had no current NATOPS manuals, my preflight preparation consisted of selecting the most sierra hotel flight suit I could find in my closet, emblazoned with patches and memorabilia of better times. Fighting to hold down my shame, I also snuck into a dark corner of the room and affixed the damning lip mike to my hardhat. I was ready to go.

I was to meet the plane commander at base ops promptly at 0630. He was a seasoned veteran, possessing in excess of 100 hours in the C-1A, all acquired during the past 2 years. The fact that he hadn't flown in the 3 months since return from cruise was apparently irrelevant to a man of his experience. He, too, had a jet background, and in fact was a former squadronmate of mine, so I knew there'd be no sweat.

When he hadn't shown by 0645, I figured I'd better display some initiative and started filling out the DD 175. I was doing just fine until I came to the cruising altitude column. Having never filed a DD 175 below the jet route structure, I wasn't sure if I had filed for six or sixty thousand feet. Figuring that catching accidental oversights was what the duty officer was getting paid for, I pressed on. The next puzzler was the true airspeed. I recalled flying wing on a *Stoof* once and just about stalling with full flaps down and gear up, so I converted some airspeeds and came up with 185 KTAS. In retrospect, this turned out to be one of the better things I did that day.

Bluffing my way through the rest of the flight plan, I had everything ready to go when the puffy-eyed TPC arrived, offering muttered comments about submitting a UR on his alarm clock, or something. He gave my flight plan a cursory once-over, signed it as clearing authority, and proceeded with the brief. The brief was all-inclusive, covering everything up to and including where the aircraft was parked. While walking to the plane, he asked what seat I wanted, and shrewdly knowing that everything good in the Navy is done to the left, I opted for the port seat.

I must confess that once in the aircraft, my confidence and bravado started to fail. After becoming hopelessly entangled in the parachute connections, I finally opted for the "when it's my time" philosophy and didn't even put it on. Ominous words that up to now had been only safety message lingo now started to haunt me. Overboost, backfire, mag check, and ring fuzz (I had always thought that's what you got from your navel) all started ringing in my head. But with a little coaching and luck, I got the props spinning and the checks completed.

By the time we finally reached the hold short line, I'd read through at least seven checklists and badly needed the bladder pressure release checklist. However, being convinced by the TPC to hang on for a few more minutes, we took the duty, did yet another checklist, and finally leapt (crawled?) into the blue.

Once the beast got airborne, things started to seem at least vaguely familiar, although it was difficult to hold back tears as Center cleared someone else to FL310, while we leveled at 6 thou after 10 minutes. After a while, I started to get the feel of the bird, but the experience has to be described as something less than exhilarating. Watching the DME click off was like watching the minute hand in a boring class at the end of the day.

We decided to shoot an approach at an enroute field, so the TPC pulled out his low altitude approach plate to study the procedures for "Downtown Podunk" municipal airfield. Setting the approach plate down to tune a radio, he told me that this was the approach we were going to shoot. I picked it up from the center console where he had laid it and breathed a sigh of relief when I saw it was a TACAN approach rather than some weirdo LF-ADF, ILS, OMNI, LOCALIZER, or whatever else the many-motor people try to confuse us single-seaters with.

I tuned the TACAN into the station depicted on the approach plate and proceeded toward the fix, thumping the DME window periodically to ensure that the digits were still moving. We were handed off to the local Flight Service Station for the approach since the field was a nonradar facility. I proceeded to shoot what I considered an exemplary approach. The airfield loomed

directly ahead of the end of the approach, and though it seemed unnatural to land at an airport without a tower, I dropped the gear and swooped on down for an envisioned squeaker landing, which turned out to be more of a thumper. Just a good carrier landing, I told myself.

Cobbing the throttle on the go-around brought a wince from the TPC and a deathlike cough from the engines, but all held together, and we were airborne again, turning toward our next checkpoint. About this time, it occurred to my incredibly keen mind to question why an airport would be named "Downtown Podunk" when it was out in the middle of rural America. I shrugged it off as a quaintity of the local populace until radar contact was reestablished with Center *20 miles south of Downtown Podunk Airport!* Realizing that we were going about 2 miles a minute, and that I had called Center about one minute after the touch-and-go, I didn't have to bring out my electronic computer to realize that Center and I didn't agree as to our location. Almost reluctantly, I returned to the approach plate and had my worst fears confirmed. Podunk had two airports; a Downtown Podunk, which was in fact downtown *(and the one we had been cleared to land on),* and Podunk County airport, about 15 miles out of town! *We had shot an approach and landed at a different airport than we had been cleared for.* Fortunately, that airport, too, had no control tower, radar facility, or traffic when we arrived, so we got away with it – but oh, the potential for disaster – not to mention flight violation.

The rest of the flight was anticlimactic. We returned the aircraft in one piece, but our pride had suffered a blow that would take longer to heal. As I walked away from the aircraft, I was really ashamed; ashamed about the unprofessional conduct of the entire hop. I had always considered myself an extremely conscientious pilot, but I did things in this environment that I never would have dreamed of doing in an operational billet. Just because I was now flying a prop, I had dropped the professional standards that had stood me in good stead. It could easily have resulted in an accident.

The reason for the misunderstanding about the approach was easy to determine. The TPC picked out the approach he wanted to shoot, laid the approach plate face down, and I picked it up face up and proceeded to shoot the wrong approach with the similar name. The lack of a brief, lack of communication, and the assumption that we both knew what we were doing almost did us in.

Needless to say, I was never so casual with the C-1 after that. Indeed, I was more vigilant than usual because of my unfamiliarity with the aircraft and the infrequency of the flights. But now that I have been mercifully removed from that billet, I reflect back on the whole program and marvel at why more accidents don't occur during shipboard proficiency flying. All the safeguards of a normal squadron are omitted on a ship, at least the one I was on. There was no NAMTRADET, no ground school courses, no OFTs, no formal training syllabus, and only infrequent flights. It made me think that all these years I had been laboring under a false impression: there *is* luck involved in safety, and the accident-free year the ship just finished attested to this.

To those responsible for aviation safety (aren't we all?), I submit that shipboard proficiency flying is the proverbial accident waiting to happen, and some immediate, positive action is needed to shortstop a disaster. Why don't we send pilots with ship's company orders to 4-5 weeks TAD at NAS Corpus Christi to go through the S-2 ground school, procedural trainers, NAMTRADET, and a NATOPS/FAM syllabus? Furthermore, I think a review of the minimum flight hour requirements for a plane commander (100 hours in type) is in order. Increasingly, ship's company personnel report with no recip background whatsoever, and 100 hours spread over 2 years is hardly enough time to remain proficient, let alone be responsible for a crew and crew training. Next, let's apply the tried-and-true procedures that are a way of life in an operational squadron and use them in a proficiency job where they are *really* needed. This includes, just for starters, thorough briefs, an up-to-date standardization program, and a complete and meaningful training syllabus, tailored to the individual's background. And finally, with the additional requirement for aviator commanders on ship duty to fly 100 hours a year, it is physically impossible for one ship's aircraft to meet minimum requirements for every ship's aviator, let alone provide true proficiency training. It seemed obvious to me that either more aircraft are needed, or fewer pilots should be required to fly, or other flying opportunities be made available to ship's company aviators.

In the meantime, though, bear in mind that if a delta sierra like this could happen to a great jet pilot like myself, it could happen to anyone. The proficiency flying hazard can be diminished by individual performance, but in the long run, don't really expect proficiency flying to make you proficient. I have concluded that the goal of proficiency flying is to live through it – and then return to the Fleet to fly *real* airplanes – safely. ◄

Minor scuff marks on the outboard pockets of all main rotor blades was the only damage incurred in a . . .

VERTREP Incident

AT the time of the mishap, the CH-46D was in a hover about 35 feet above the deck of a DD. Hanging below was a 1000-pound external load. This was the second of four loads to be transferred. The first load of 3400 pounds had been safely delivered.

While in the hover, a crewman aboard the helo recommended that the pilot ease slightly forward and drop down a few feet to facilitate the work of DD personnel. The pilot maneuvered carefully as requested, but, in so doing, moved out of the safe obstruction-clearance envelope. His MRB struck the fiberglass reflector of the ship's radar.

A waveoff was executed, the helo returned to the supply ship, and a landing was made to inspect the damage. Damage wasn't extensive, but the rest of the mission was scrubbed.

Many safety violations surfaced when the operation was reviewed, and they boil down to the fact that the VERTREP crew was unprepared. For example:

- The pilots were unfamiliar with both the supplying and receiving ships. They didn't know what the deck markings of the DD meant.
- Prior to flight, they had not consulted the *Helicopter Operating and Support Facilities Bulletin No. 1B.* Neither were they briefed by DD personnel about their deck markings.
- During hover, before zapping the radar reflector, the pilot lost sight of the DD's LSE.

Weather and sea conditions for the mission were excellent. The sky was clear with unrestricted visibility, seas were calm, and the winds were 050/09 knots relative.

The reason for some of their uncertainty with both the supply ship and the DD is that the pilots were part of a detachment onboard a third ship. Since the VERTREP mission was to be only four loads, the Det OinC crossdecked just the one bird and crew.

To prevent any further such incidents, the OinC reported that future preflight briefs would be comprehensive. All pilots will become familiar with the *Helicopter Operating and Support Facilities Bulletin No. 1B,* and briefings will cover in detail the certification, markings, and limitations of any ship with which they'll operate.

A recommendation was made that all helicopter VERTREP crews and ships with helo landing platforms review the *Bulletin.* Since that has been helicopter SOP for many years, it is hoped that only this one detachment was out of step with the rest of the world.

A Bird in the Hand...

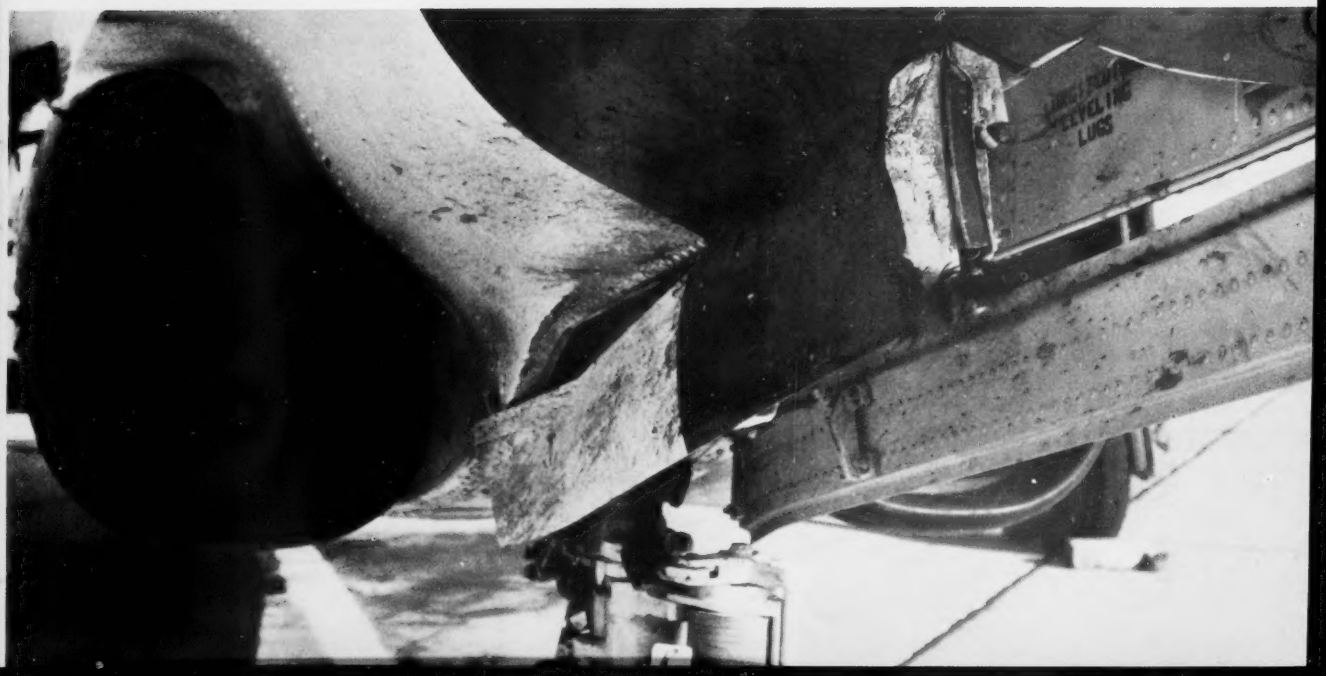
By C. F. Wise
VT-26

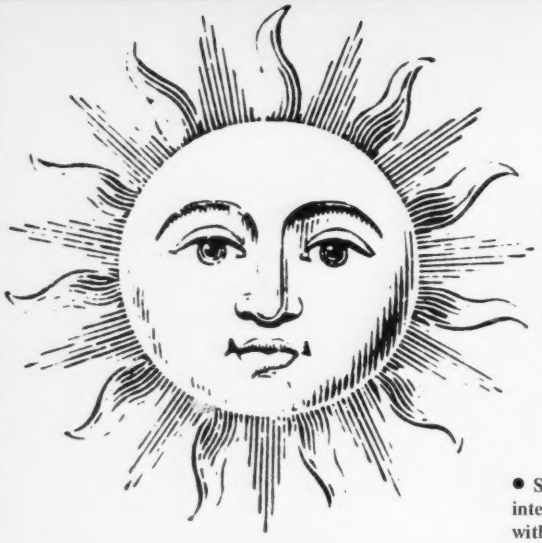
WHILE departing the FMLP pattern at NALF Remote, ENS I.M. Solo was accelerating through 220-230 KIAS in his trusty *Buckeye* when he was suddenly and forcefully smitten by a medium-sized object of an ornithologist's delight (hereinafter referred to as a *F*ickle *F*ine *F*eathered *F*riend). This 4F birdbrained Mutha' created a 3-inch hole in the *Buckeye* windscreen and even had the "guts" to strike our intrepid Ensign squarely on his helmet visor.

The ole 4F (and windscreen fragments) did not harm our budding young aviator, however, for he was a well-behaved lad who adhered to NATOPS procedures and kept his visor down. His vision, however, was severely restricted. Nonplussed, ENS Solo raised the visor, cleared the lump from his throat, and brought the *Buckeye* in for a landing (and needed repairs).

The moral of this story is a "bird in the hand is a big mess, but it's a heck of a lot better than a bird in the kisser." ◄

This article and the various bird strike photos accompanying it should reemphasize to all aircrews the damage potential even a small bird can present. Is any more motivation needed to keep that visor down and mask on? — Ed.





Letters

If what you did yesterday still looks pretty big to you, then you haven't done enough today.

Ace L.

Safety Shoes

NAS Anyplace – Getting safety shoes is a problem in our squadron. It seems like it takes forever to get them. Some people have been waiting for 6 months or longer. The reason is either they don't have the money in supply to get them or they were ordered wrong and all have to be reordered. I haven't had any in the last 6 months, and I don't want to get my feet crushed. I don't think it should take that long to get a pair of safety shoes.

Baretoedmouse

• General use safety shoes are available in the supply system for enlisted personnel. Special use shoes are also available for enlisted, officer, and civilian personnel. We recommend you contact your safety officer, supply officer, department head, exec, or CO – ASAP.

What's a "Nugget"?

Washington, DC – I note that two articles in your FEB '75 issue used the word "nugget" to denote a pilot who is what we old prop jockeys from previous "police actions" used to call "green." Nugget was also used in those days of long ago, but it meant a throttle jockey who was a "jewel" or an "ace."

What happened in the intervening 25 years to give a 180-degree change to the meaning of this word?

W. Boyes
Chief, Ground Operations Safety
HQ, NASA

• Since receiving your letter, we've interviewed numerous naval aviators with 20 or 25 years service and all agree that they have always heard "nugget" used to denote a recent graduate of the Navy flight training who is on his first tour as a designated naval aviator. Exactly how the current meaning of "nugget" evolved is not known. Maybe some of our readers know more about this word, and if so, we invite them to let us know. We'll print any items of interest.

A variation of the "nugget" has appeared in recent years as a result of the "Plowback" Program (immediate return of a graduate to duty as an instructor). When these pilots report to their first fleet squadron, they have a lot of flight time, but are still on their first operational tour. Therefore, they have earned the appellation "polished nugget."

A-7 Wet Runway Landing Accident Fallout

NAS Lemoore – Several statements made in the "Wet Runway Landing Accident" article in the NOV '74 issue are incorrect, or at least based on erroneous information. In order to ensure that the most current information and recommended procedures are at least exposed to the operators of the A-7C/E, I believe the following should be considered:

The statement that "A far more important consideration is the additional energy that must be absorbed during rollout . . . " is incorrect. A new chart will be published in the forthcoming NATOPS Manual which will show that under most landing conditions, brake energy limits cannot be exceeded in the A-7. Gross weight is an important factor in that it requires relatively high airspeeds for heavy fuel states, thus increasing ground roll approximately 1000 feet for each 10 knots of speed increase. Thus, even though increased energy must be absorbed by the brakes, they are capable of the performance required, and ground roll need not increase due to braking limitations.

NATOPS states that under the conditions mentioned in the article, only 3000 feet of runway remaining is required to get airborne again if airspeed is 80 knots or more.

In conversations with Pax River, it was determined by tests run at Edwards AFB that no significant decrease in landing roll was gained when the engine was shut down. Rather than helping to stop the aircraft after landing, shutting down will actually create a more hazardous situation, especially in the A-7C/E. Nose gear steering, increased aerodynamic control through AFCS, and antiskid braking will be retained if the engine is left running. Neither Vought Systems Division nor any fleet operators of the A-7 support shutting down as a viable solution to decreasing rollout. Finally, several changes were incorporated during the NATOPS conference held last October which will provide additional information and recommended procedures for landing in adverse conditions.

LCDR A. A. Nichols
VA-122
A-7E NATOPS Model Manager

• Words from those with expertise are always welcome additions to APPROACH.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Antiexposure Suit

FPO, New York – In the JAN '75 APPROACH article titled "Winter Water Survival," you state that *"General NATOPS* requires an antiexposure suit." OPNAVINST 3710.7G, para 705, pg. 7-4, states, "The final determination with regard to the actual wearing of antiexposure suits shall be made by the commanding officer of the unit concerned based on all pertinent facts . . . "

It appears to me, that with the CO's approval, squadron pilots may legally fly without the antiexposure suit in conditions which do not meet the minimums described in para 705, and, therefore, the conditions given do not form a true requirement. If this is a misinterpretation, I believe a rewording of OPNAVINST 3710.7G is in order.

P. R. Schoeffel
VA-82

• The situation is as stated in the next to the last paragraph in the APPROACH article which gives the air and water temperature minimums from NATOPS and says, "The commanding officer makes the final determination in a judgment based on all pertinent factors."

A squadron CO can legally decide that his crews need not suit up when water and air temperatures do not meet the minimums. But this is not a decision to be taken lightly.

A CO must take into consideration all pertinent factors as NATOPS states: class aircraft, type and duration of assigned mission, ambient cockpit temperatures, suit ventilation features, combat versus noncombat environment, availability of SAR facilities, etc. If a CO makes the decision to waive the suit requirement, he is accountable if something goes wrong. He must be prepared to present valid reasoning to justify his decision.

Without this prerogative to waive the suit requirement, NATOPS would be too cut and dried on the subject. The waiver affords responsible people the latitude to look at the local operational situation and make the final decision where it counts.

(Please see next letter.)

MCAS Cherry Point – . . . What OPNAV is saying is that there are many more considerations than just the air and water temperatures, and the person who must weigh all of these variables and come up with the decision should be very close to the mission concerned. I am in complete agreement with this philosophy and dread the thought of someone further up the chain of command and further removed from the aircraft making these decisions for me.

The real problem in the article "Winter Water Survival" is that the pilot did not have a valuable piece of survival equipment on when he needed it. Why not? I don't know the particulars of why this A-7 pilot elected not to wear his antiexposure suit. I can only surmise it was for the same reason many of the aircrews in my squadron (myself included) are reluctant to wear them – *poor fit!* Some are so bad they actually cause pain.

Generally, the reason for the poor fit is because the suit was not fitted to the individual. It has been inherited from someone who has recently departed the squadron. Several of the members of my squadron (again, myself included) do not have wet suits. We must scrounge when we have a hop over cold water. If the few suits that fit us are in use, we are out of luck.

All aircrews in my squadron were measured, and wet suits were ordered in July 1974. Message traffic from the ASO (Aviation Supply Office), Philadelphia, indicates that the lack of wet suits is a Navywide problem and projects the earliest delivery date as mid-1975.

Aircrews are often guilty of not using and/or neglecting survival gear. But this is one case where the aircrews have not been provided with the proper gear. As a result, it often gets left behind.

CAPT John K. Robinson, USMC
VMA(AW)-121 ASO

• The Safety Center contacted NAVAIRSYSCOM and ASO Philadelphia for current information on the wet suit problem.

1. There is a shortage in large sizes only.

2. Plenty of medium and small sizes are on hand to satisfy demands.

3. Contracts have been let to satisfy the shortage of large sizes. The contract requirements should be met by late summer of this year.

4. NAVAIRSYSCOM has authorized COMNAVAIRPAC and COMNAVAIRLANT to purchase suits locally to meet this recognized shortage.

ASO also advises that the fleet should demand "the appropriate undergarments" from the Defense Personnel Support Center and not, as in the past, from Aviation Supply.

SSS (Sorry Supply Support)

FPO, New Frisattle – In my 29 years in naval aviation, much lip service has been given to safety as applied to supply procedures, maintenance practices, and airframe directives.

I find that in the P-3 community, trying to live by the rules subjects one to much flak from all quarters. Upon my arrival in the squadron, I spent a month watching the operation. Then I cleaned house – causing 188 line items consisting of 700 separate aircraft parts to be returned to the supply system. Some of these were NORS items the squadron didn't even know they had!

What happened to surprise – real surprise inspections by higher authority that were supposed to keep everyone honest? The result of the housecleaning is that now I have to maintain nine P-3 aircraft utilizing a supply organization that is only 20-27 percent effective, with off-station requisitions averaging 20 days.

This situation has resulted in massive cannibalization actions not only of black boxes, but also of safety of flight items such as props, prop controls, brakes, mainmounts, fuel controls, etc., *ad infinitum.* Every squadron that deploys "benefits" from a rape conference that strips nondeploying aircraft of parts to get the deploying squadron airborne. During a recent maintenance ADMAT inspection, we were told that "You have to realize you are the same as deployed here and will have to have two hangar queens to keep your other aircraft flying."

Now, isn't that ridiculous! I have found that operational commanders are deaf to maintenance problems – especially if the problems interfere with flying the OPTAR. I sincerely hope the Safety Center can make someone listen.

LCDR AMO

• Yes, it is ridiculous and no platitudes will be offered. VP maintenance officers inevitably turn into pack rats out of sheer frustration and the desire to keep 'em up no matter what. Supply support, despite all kinds of sophistication "in the system," has seldom been responsive to the squadron AMO who needs something ASAP. Occasionally, you have a better chance of getting an extra aircraft than a lousy fuel control or prop. The only way to improve your situation (at someone else's expense) is to holler, follow up, holler, enlist Wing help, follow up, and holler. ◄

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DEPARTMENTS

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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CREDITS/This month's cover is the T-34C, painted by Beech Aircraft artist Bill Winters. The new turboprop *Mentor* will replace both the T-34B and T-28C and will be the mainstay of Navy basic flight training for years to come. **Pg 21** cartoon idea submitted by CPL Carl D. Griffin, H&HS ATC—TWR, MCAS El Toro.

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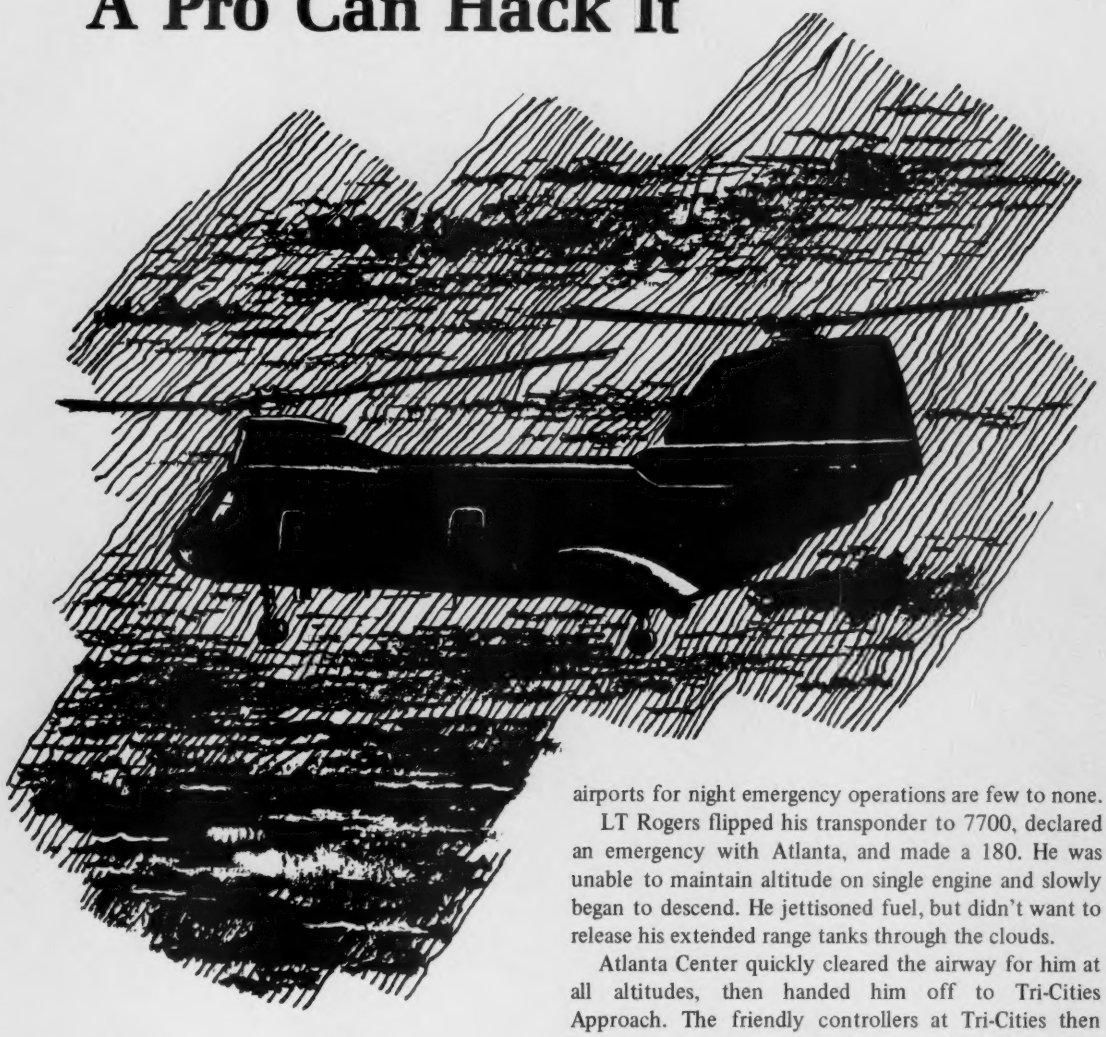
During their careers, many aviators are faced with a situation when stark terror and near panic arise. The emergency may be the undoing of some, but . . .

A Pro Can Hack It



First Lieutenant James E. Rogers, USMC, stopped at a mid-Tennessee airport one night to refuel his CH-46F. The next leg, to Quantico, would be the final leg home. Servicing completed, he launched.

About 45 minutes after takeoff, while cruising at 7000 feet in the clag, his gages showed No. 2 T_5 dropping through 100 degrees. The No. 2 N_f had dropped to 10 percent.

Anyone familiar with the Knoxville area knows the eastbound MEA along the airways varies between 4000 and 6000 feet. There are some pretty solid hills in that country, and to complicate the situation, available airports for night emergency operations are few to none.

LT Rogers flipped his transponder to 7700, declared an emergency with Atlanta, and made a 180. He was unable to maintain altitude on single engine and slowly began to descend. He jettisoned fuel, but didn't want to release his extended range tanks through the clouds.

Atlanta Center quickly cleared the airway for him at all altitudes, then handed him off to Tri-Cities Approach. The friendly controllers at Tri-Cities then began to sweat him out. His No. 1 engine continued to purr sweetly, and LT Rogers, by following radar vectors from Approach, broke out of the clag at 3000 feet where he found a safe altitude. At that point, he was able to maintain altitude until starting a descent to the airport. He made an uneventful run-on landing.

Fuel samples taken from both internal and extended range tanks showed considerable water contamination. All filters were checked and tanks drained until clear samples were obtained.

The following day, after help had arrived, he hover-checked his bird for 15 minutes and then completed his flight home. Well done! ◄